ENGINEERING NEWS-RECORD

MAY 17, 1956

PRICE 35 CENTS

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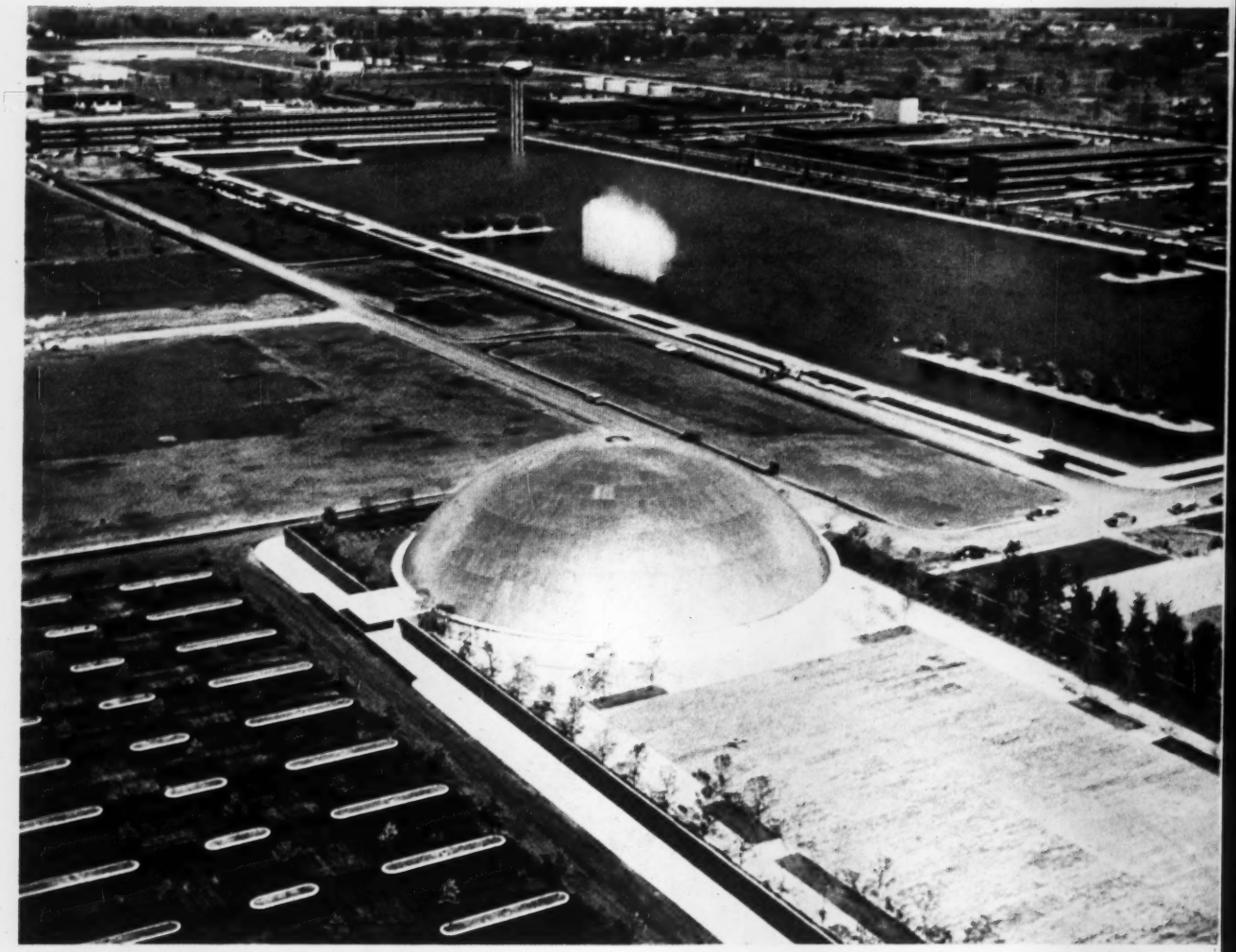

GM RESEARCH BUILDINGS—

Novel Today, Normal Tomo

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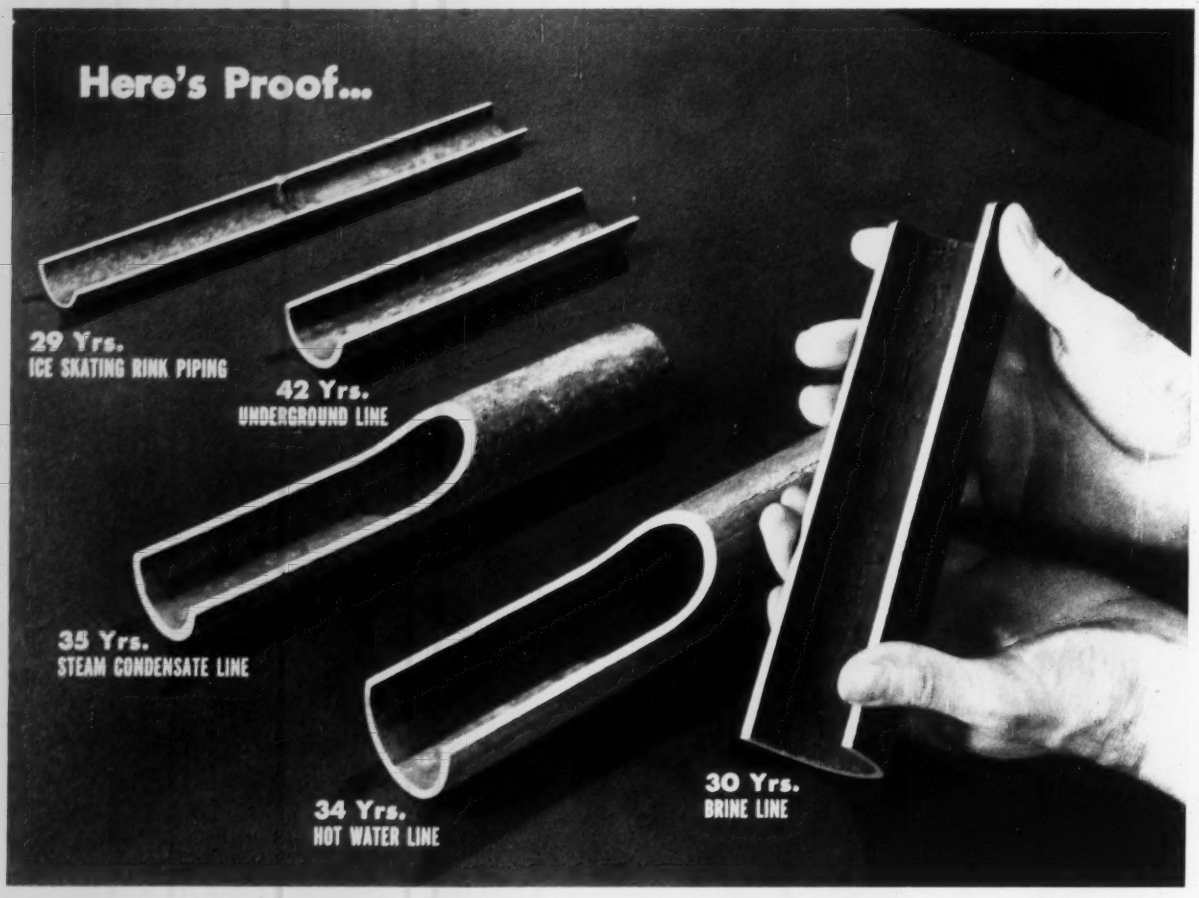

WROUGHT IRON PIPE Saves because it Serves longer

True, there's no set rule for predicting how long a pipe material will last in any corrosive service. But there are a lot of mighty dependable clues. The most practical and dependable of all is *service under actual field conditions.*

How does wrought iron pipe measure up when this service-life yardstick is applied?

The answer is documented in the pipe sections shown above. Here you see *actual* samples taken from wrought iron pipe installations in a variety of services. Some of these sections came from buildings that were being torn down. Some were actually cut from in-use installations by our laboratory staff. These sections are interesting not only from the viewpoint of service life, but also pipe condition.

You'll find the reason for wrought iron pipe's ability to last longer in the material's structure and composition. Tiny fibers of glass-like iron silicate are threaded throughout the body of high-purity iron. These fibers are immune to corrosive attack. When corrosion strikes, these fibers halt and detour the attack, prevent rapid pitting and penetration. When you consider that there are more than 250,000 of these fibers to each cross-sectional square inch of wrought iron, it's easy to understand why this material is more than a match for corrosion.

Our bulletin, *Piping for Permanence*, tells more of this story, and covers a variety of services where wrought iron pipe saves because it serves longer. Write for your copy.

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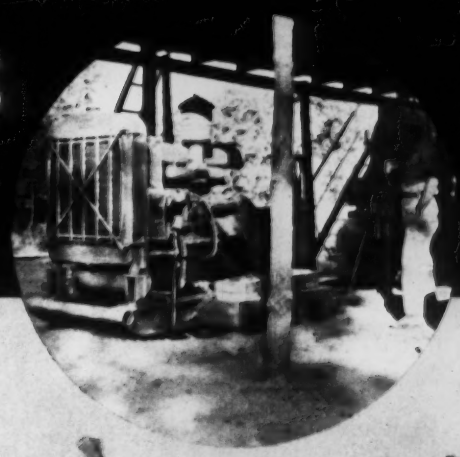
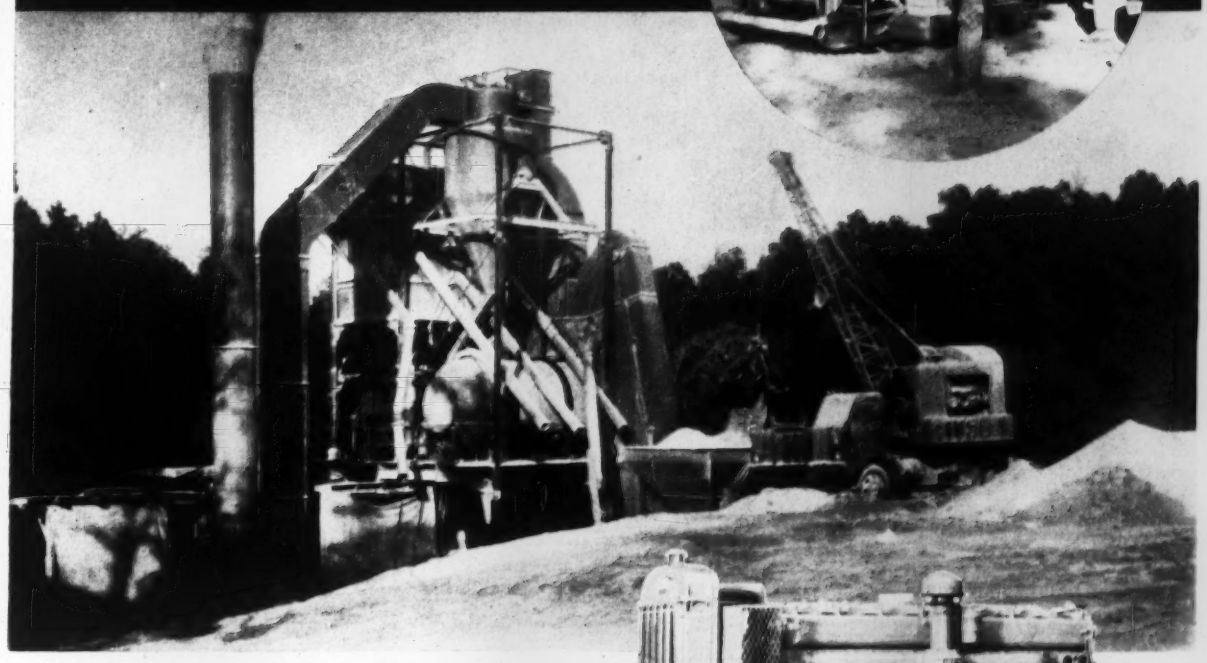
"I'm asking for MURPHY DIESELS on all replacements"

Says: R. C. DERRYBERRY / Plant Foreman
Southern States Paving Co.





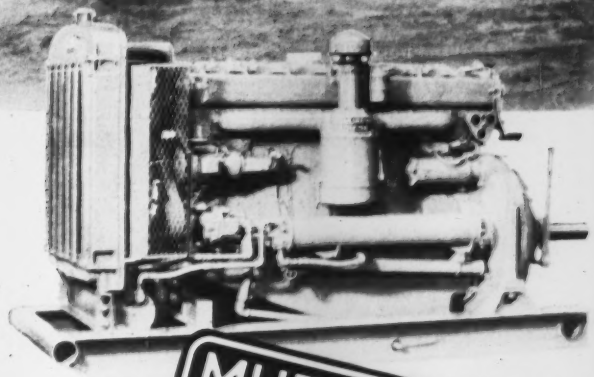
The best way to find out what Murphy Diesel Power can do for you is to use it. The next best way is to ask an owner about his experience.

R. C. Derryberry, Plant Foreman, Southern States Paving Co. says:

"From experience with other engines I can honestly say the Murphy is the best for ease of starting, low fuel cost, low maintenance . . . I'm asking for Murphy Diesels on all replacements."

Mr. Derryberry has been operating a Simplicity hot mix plant near Lawrenceburg, Tennessee. He gets his power from a 64 K.W. Murphy Diesel generator set. He is able to operate the engine at about two-thirds load to turn out 1200 tons of hot mix per 14 hour day, six days per week.

Enough said? Ask your Murphy Diesel Dealer to show you how Murphy will fit into your picture.



MURPHY DIESEL

334

Heavy duty power

for construction

Murphy Diesel Engines and Power Units are available in sizes from 96 to 264 H.P. Engine speeds are 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

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Symons FIELD REPORT...

Symons Forms, Shores and Column Clamps Used On 525 Ft. Aqueduct at Streator, Illinois...

to carry a 27-inch pipe across a ravine.

Symons solved the difficult task of setting up to pour concrete around the vitrified tile pipe, averaging 225 pounds per foot. Weight of pipe and poured concrete is over one ton per lineal foot.

Footings 7′ x 7′ and 1′3″ thick were first built for the concrete piers spaced 25 feet apart. Symons Column Clamps were used to form the piers—12″x 24″ at the base, 12″ x 48″ at the top and range in height from 10 to 19 feet.

The aqueduct is 4′3″ wide and four feet high. Symons Forms with steel cross members and 51-inch ties were used to form the sides, which were supported by one set of walers.

Three-quarter inch plywood formed the beam bottom, resting on 4″ x 4″ joists. Girths 4″ x 6″ were spaced every four feet and supported by Symons Safety Shores. Warren & Pragg, Decatur, Illinois, was the architect and Central Ironite Waterproofing Company, Maywood, Ill., was general contractor.

Symons Forms, Shores and Column Clamps can be rented with purchase option, all rentals to apply on purchase price. Symons Clamp & Mfg. Co., 4266 Diversey Ave., Dept. E-6, Chicago 39, Ill.

View showing completed piers and aqueduct

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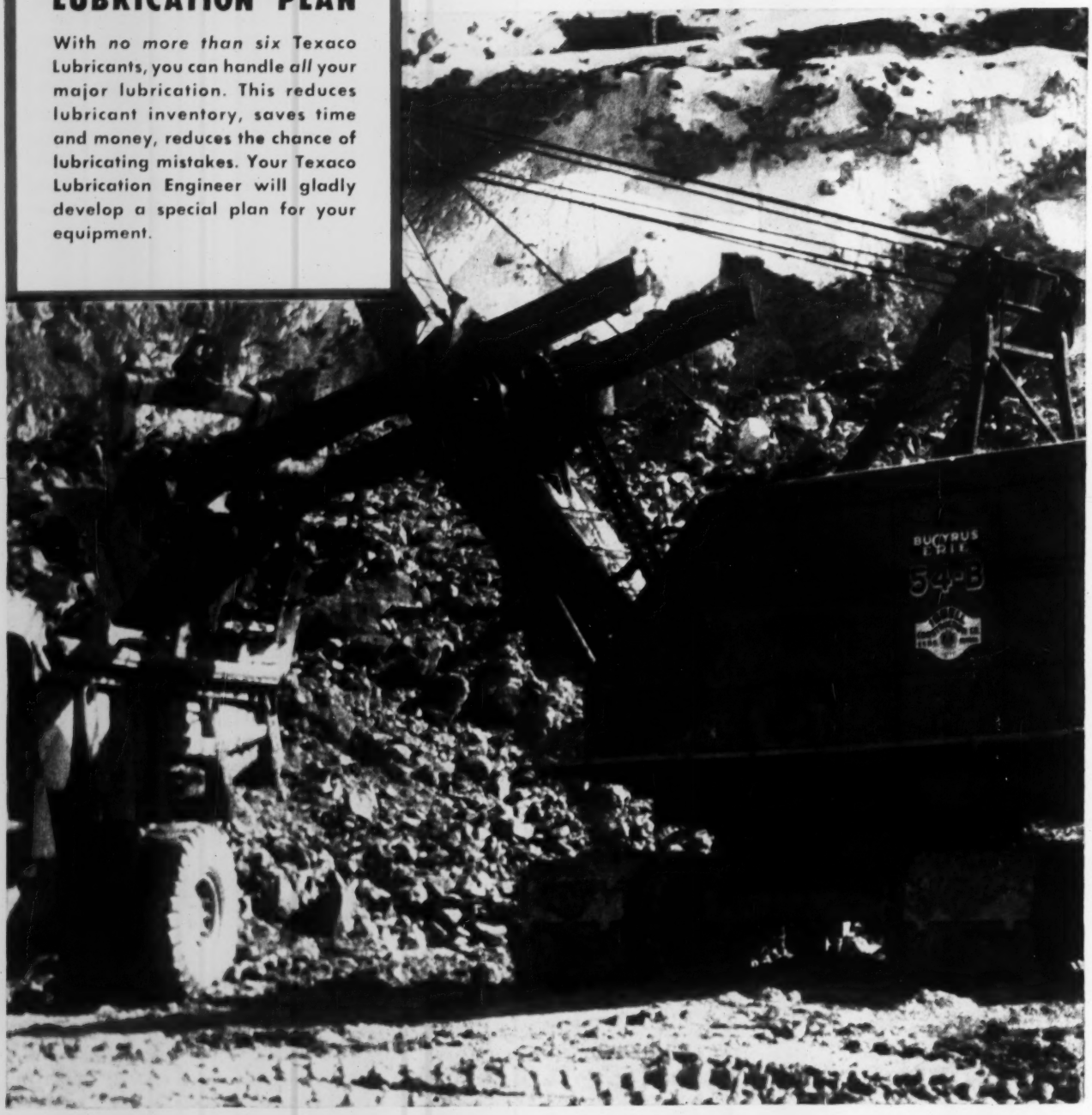

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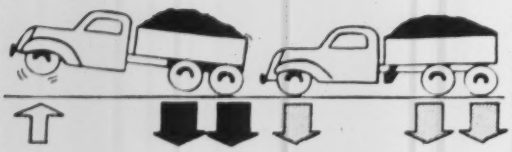

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One of three Barber-Greene Loaders owned by Laverne R. Falk of St. Ansgar, Iowa.

L. R. Falk, Iowa contractor, writes:

"Why I bought my third Barber-Greene Loader"

"We usually load a seven-ton spreader-truck in two minutes . . . handle 1500 tons in a ten-hour day. Our repair costs have been almost nil. Recently, we added a third Barber-Greene to the job.

"Our ag-lime piles are often damp, and in the winter covered with a thick frozen crust. When this material is dumped into a truck—say, three fourths of a yard at a time—it packs and is tough to remove. But our Barber-Greene Loaders pulverize lumps and crust . . . fill the truck in a loose, continuous stream that doesn't pack or clog.

"Simple operation lets our truck drivers and most of our customers' drivers easily operate our Barber-Greenes themselves."

Mr. Falk's report is typical of the 543's outstanding performance everywhere. This versatile loader moves from job to job at 15 m.p.h. . . . handles any bulk material including coal or snow . . . its hydraulically controlled swivel discharge conveyor saves valuable truck time. For loading from pits and banks and screening or scalping, Barber-Greene builds the crawler-mounted 82A. Barber-Greene Bucket Loaders are the lowest-cost method of truck-loading from stockpiles.

56-11-BL

Write for literature on this cost-cutting loader

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Two methods are used to smooth off hardened concrete: wet rubbing and dry grinding. Wet Rubbing — required for smoothing green concrete to a plaster-like finish. Use slow speed grinding wheel or disc. Apply water while grinding. Wet concrete can also be painted on with a brush, then smoothed into holes with the grinding wheel. Dry Grinding—use a high speed grinding wheel or abrasive disc to smooth dry concrete.

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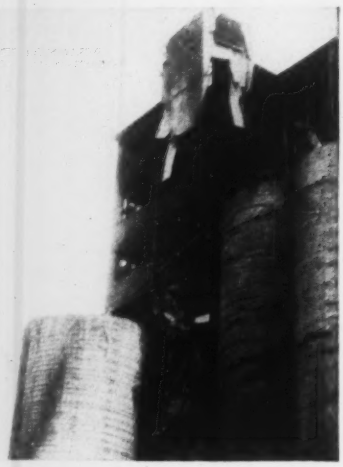

Philadelphia Explosion

SIR—On the evening of Mar. 28, 1956, a grain elevator exploded at 31st and Market St. in Philadelphia, Pa. The blast and subsequent pressures and earth shock broke windows over a quarter of a mile away. The blast was said to have been felt more than 30 mi away.

It is not often that an engineer has this opportunity to observe the effect on old and new structures of an impulse loading. Through the courtesy of Samuel S. Baxter, chief engineer, Bureau of Engineering, Surveys and Zoning of the City of Philadelphia, I visited the site and viewed first hand the effect of this explosion on the elevator and surrounding buildings.

The first unit of the elevator building was built 90 years ago and other units have been added since. The structure was partly reinforced concrete, partly wood frame with multicourse brick walls, and partly steel frame. The only parts still standing are of reinforced concrete and some very light steel framing. The steel framing is bent. The reinforced concrete part is still structurally sound although spalled. In fact the grain in the silos may be salvagable.

Other buildings adjoining the elevator offer an even more interesting study. Windows in these buildings were blown out but there was no other apparent structural damage. The main exterior columns of a building within 50 ft of the blast were undamaged, even where the curtain walls of brick masonry were exposed to the full blast impact.

Study of the buildings raises three important questions:

- Why didn't the reinforced concrete portions of the structure fail along with the wood and steel framing?
- Why was there not more serious damage to the structures 50 ft away from a blast which blew out windows more than a quarter of a mile away?
- Why didn't the masonry curtain walls fail in panels adjacent to the windows?

We do not know the answers. It is doubtful that static design loads have changed much since the first unit of the elevator was built. The heavy mass of the reinforced concrete units which remained standing, as contrasted with the light steel framing which failed, supports the promise that weight as well as integral strength helps to resist blast loads. The same can be said about the adjacent buildings. The curtain walls in part substantiate this thinking. In nearly all instances, they were undamaged while adjacent window sections were lost completely.

Does not all this suggest the need for more field data and a careful appraisal of design criteria for structures subjected to blasts? The average engineer called upon to design a blast resisting structure today is perplexed by theory of blasts, by laboratory tests, by hush-hush surrounding heavy blasts, and by proposed design codes. More basic blast data are needed—both from disastrous accidents and controlled field and laboratory tests. How can we get them?

CHARLES F. PECK, JR.
Associate Professor
Department of Civil Engineering
Carnegie Institute of Technology
Pittsburgh, Pa.

Pay as You Go

SIR—It seems to me that we in the engineering and contracting profession are building our own coffins when we zealously play up the results of an unfortunate perversion of the present-day American culture which is accepting more and more socialistic schemes

(*Continued on page 12*)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

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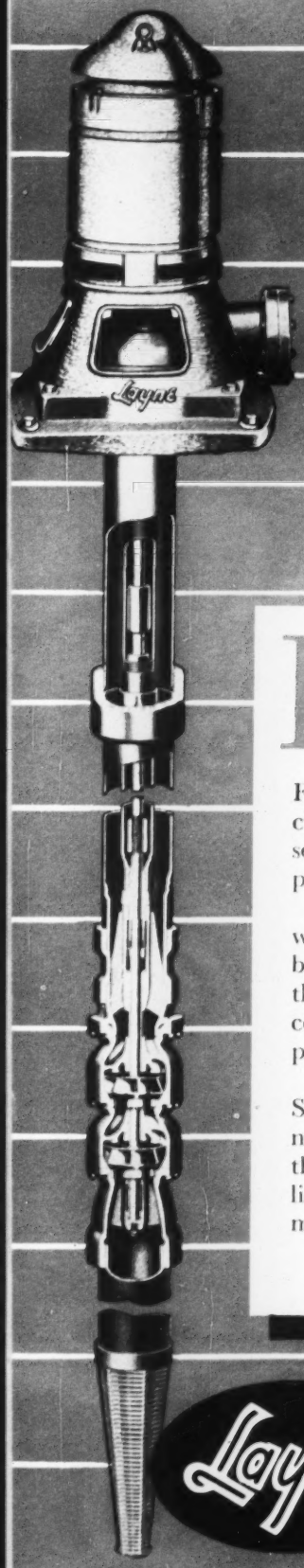

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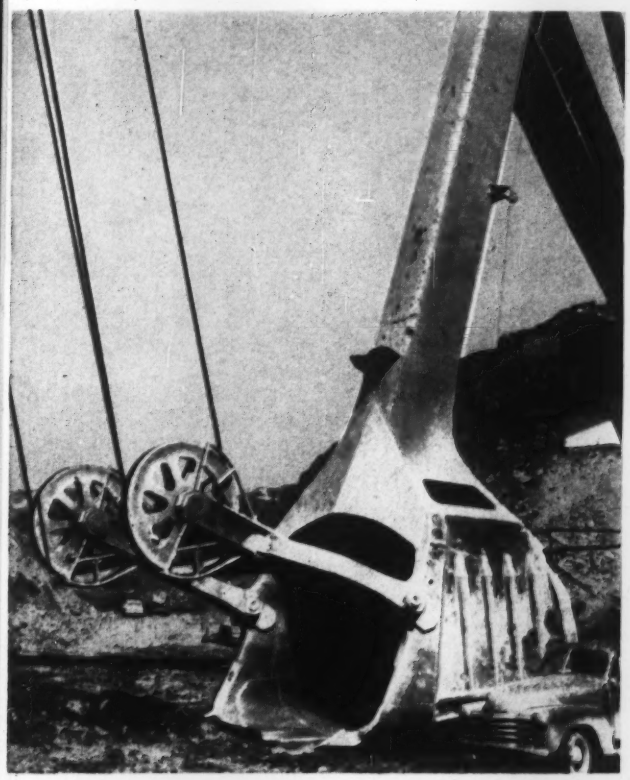

THE BIG DIPPER can scoop up 60 cubic yards of overburden, deposit it 290 feet away in piles 100 feet high. Tiger Brand Wire Rope provides the steel "muscles" that make it work.

You have to look at this shovel with your imagination—for your eyes will surely deceive you. The tip of the boom, for example, rises up as high as a 16-story building. The shovel has the power to lift a platform containing 166 1½-ton automobiles 100 feet into the air, swing them the length of a football field, set them down on top of a 10-story building, and swing back for another load . . . all this in 45 seconds!

The tremendous power of the shovel is transmitted to the dipper through two 2½-inch American Tiger Brand Wire Ropes, each 580 feet long. The huge boom, which towers 160 feet, is supported by four 115-foot lengths of 3⅝-inch diameter Tiger Brand Galvanized Bridge Strand. Each strand has a breaking strength of approximately 800 tons, for a total of 3200 tons.

In addition to the main hoist ropes and boom supports, the three-man elevator shuttles up and down on standard Tiger Brand Elevator Wire Rope.

The fact that all of the wire rope applications on this "world's largest shovel" are being handled by standard Tiger Brand constructions emphasizes the quality of the engineering that goes into the complete line of Tiger Brand Wire Rope. No matter how big and exacting the job, you can get a Tiger Brand Rope to fit your needs.

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Constant street traffic, numerous existing underground sewer, water and gas services and the need for a deep, narrow trench dictated the choice of Soapstone OCT-O-DUCT for this recent 4-block project.

Soapstone OCT-O-DUCT was selected, because of its easy-to-handle 4-foot lengths, its flat sides which allowed tiering with no spacers, its flexibility made possible by simple couplings, and its trench-side delivery.

Preferred for 30 years by Western construction men, OCT-O-DUCT gives you speed, economy and unmatched flexibility.

Write for NEW illustrated catalog 56-A to get the full story. For more about the Nob Hill job, ask for Bulletin 102.

SOAPSTONE DUCT COMPANY
3985 Beach Street
Oakland 8, California

for bettering (?) itself. Is it not quite evident that our backing of government power projects, government reclamation, government education is one of the greatest pressures for the scaling of the doom of private enterprise in America? Is it not reasonable to expect the condition of technological enterprise to fall eventually to that of the unfortunate modern day American farmer who is now being stripped of all his liberties of enterprise which he once used as the chief means for his survival?

Are we—the engineering profession—for or against socialism? The cry from the pseudo-antisocialists that we must use nature's resources to a greater degree seems too similar to that of the man in enterprise who uses without prudence all the latest modern devices without having the money to pay for them or the modern day family who decides that a newer automobile, refrigerator, dishwasher, or even a new home is necessary when money therefore is only assumed to be forthcoming.

Living in the future is quite unrealistic, quite dangerous. The amount of tragedy which occurs when the axe finally falls is dependent on the amount to which we have perverted ourselves.

Is this fair to our youngsters who will probably bear the brunt of the costs of a boom America?

Let's get down to earth as fast as we can by eliminating our perversions now while the opportunity is still with us. "An ounce of prevention is worth a pound of cure."

R. I. Hodgins, Jr.
St. Paul, Minn.

Arch Dams

Sir—The editorial "Why Not More Arch Dams For The U.S." (ENR Apr. 12, 1956, p. 134) makes some sweeping statements which paint American engineers with a wide and black brush. You state, "It seems likely that American engineers have avoided arch dams more because of the length and complexity of the design computations than for any other reason."

In over twenty years' experience in the design of dams, I personally do not know of an instance where an arch dam was "avoided," and another type adopted. Neither do I know of one project where careful economic studies of the feasible types of dams were not made to determine the economic type, considering overall cost.

It is elementary to state that two factors must be present to make an arch dam feasible and worthy of investigation. First, the canyon must be reasonably narrow; and second, the rock must be reasonably sound. In the U.S., only a compartively small percentage of dam sites satisfy these conditions.

A design problem very often present in the design of dams in the United States is the large quantity of flood water to be discharged where the topography does not permit the use of a side channel spillway. A spillway over an arch dam to discharge 20,000 cfs is quite a different problem than when the discharge is 200,000 cfs or greater. It is a still more serious problem as the height of the dam is increased.

An example of the features involved in design is the Bhakra Dam in India. The narrow gorge at the site inspired many designers to recommend an arch, and to criticize the "American" design of a gravity dam. However, the foundations were unsuited to an arch dam, due to wide bands of claystone, and an arch dam could not fit the topography and at the same time properly cover and protect the claystone bands.

The steep sides of the Bhakra gorge resulted in a gated spillway in the center of the dam. Such a spillway destroys the arch action in the upper portion of the dam and introduces other problems.

It may be of interest to know that among the many recommendations not adopted was one suggesting a buttress dam at the Bhakra site. The Bhakra Dam is to have an hydraulic height of over 500 ft, with the foundations as described above, and is located in a highly seismic area. The recommendation did not come from an American engineer.

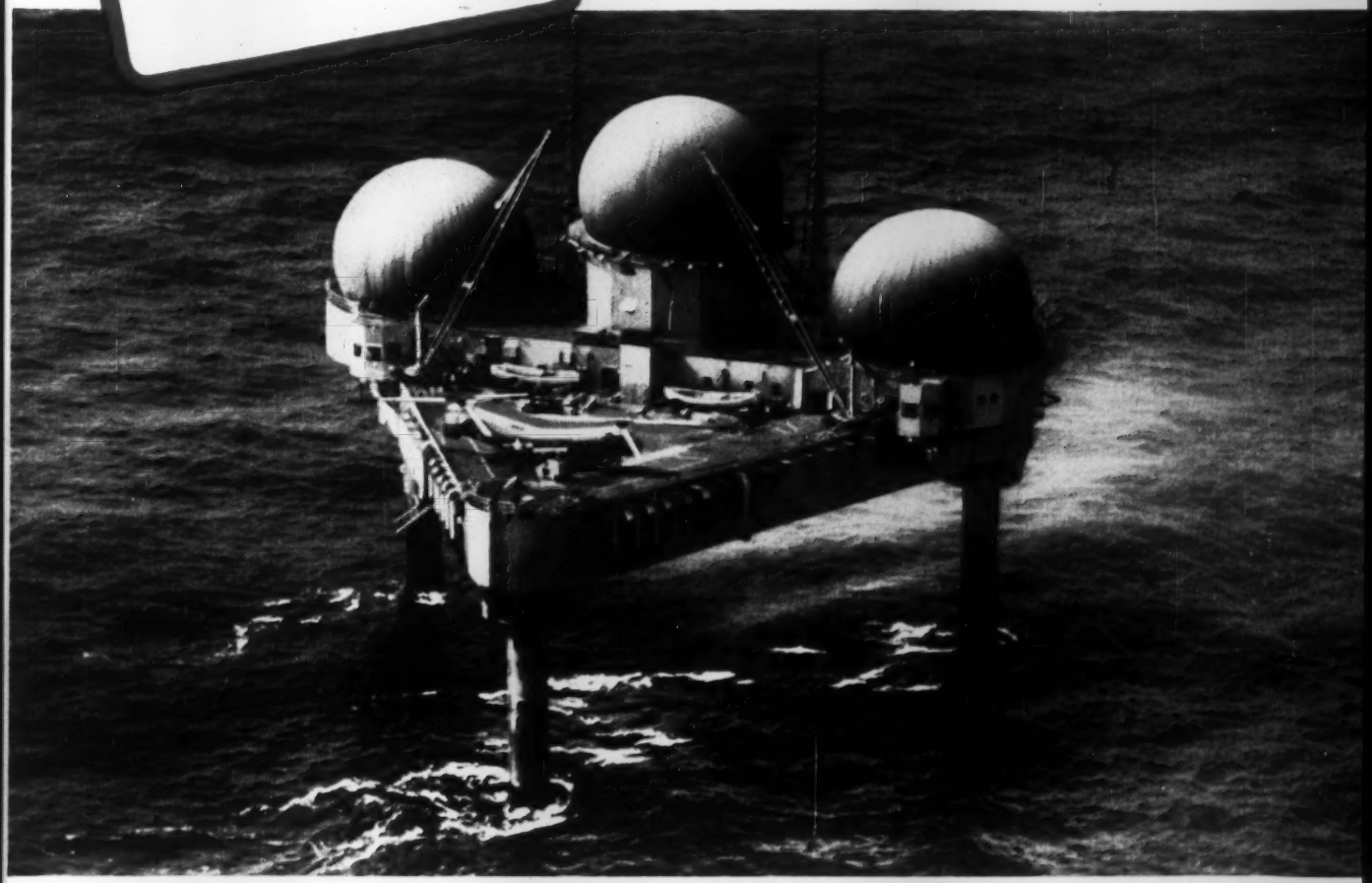
It is my personal opinion that the principles of arch dam analysis are known to a large number of American dam designers, and that they have neither fear of such analysis, nor desire to avoid it.

Bruce M. Johnson
Harza Engineering Co.
Chicago

[Editor's Note—Thanks to Mr. Johnson for an interesting discussion. It fits the purpose of the editorial, which was to bring arch dam consideration to the attention of engineers generally, and to arouse whatever interest in them is justified—taking into account their limitations such as available sites and restricted spillway capacities, indicated by Mr. Johnson.]

(*Reader Comment continued on p. 18*)

completed ... another RAYMOND first!



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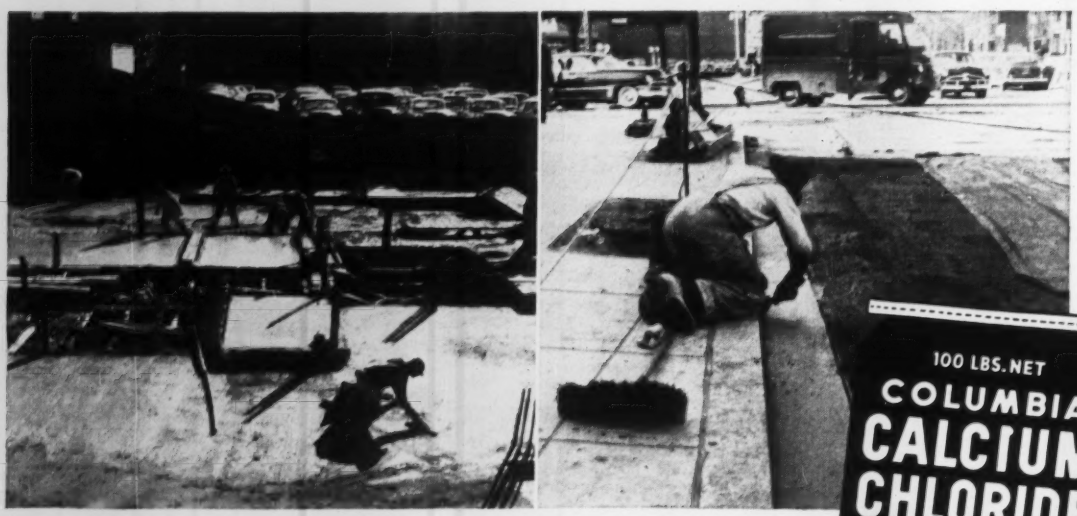

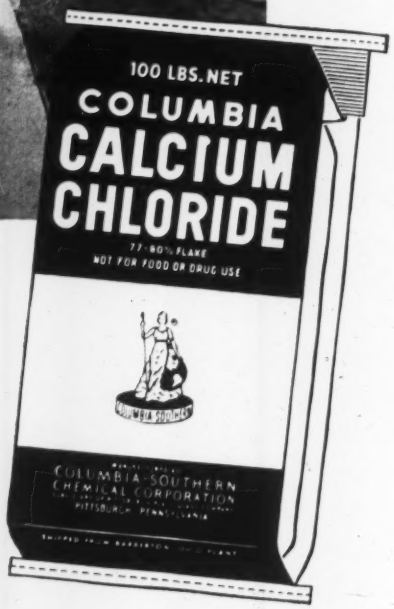

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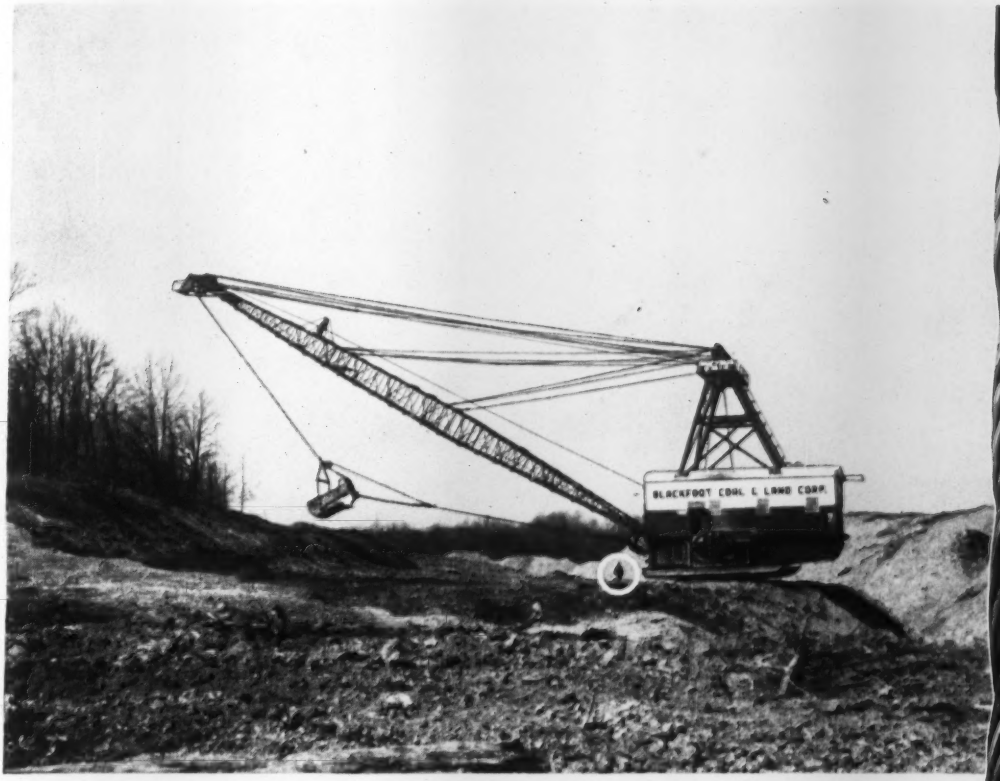

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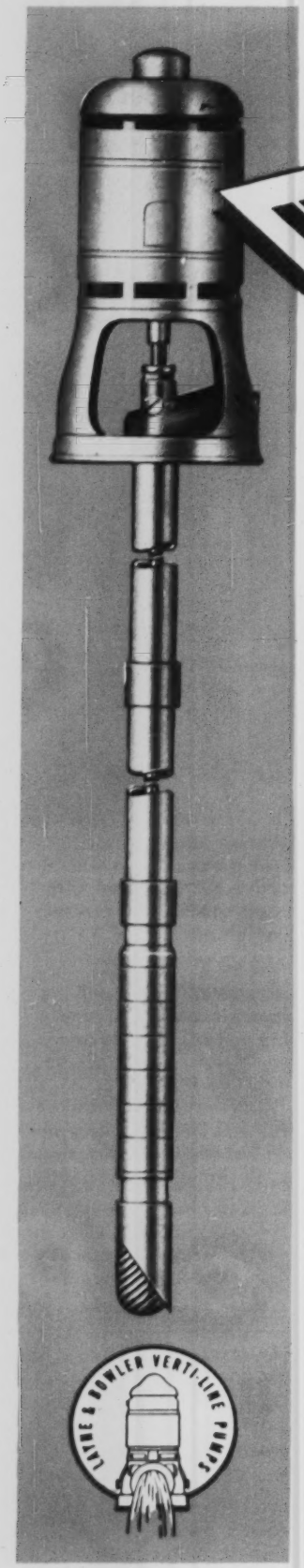

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. . . Reader Comment

SIR—Your editorial concerning arch dams (ENR Apr. 12, 1956, p. 134) is particularly interesting to the writer, because I have worked on the relaxation method for the solution of the same differential equations which would be used on dam analysis.

We have used this method on the analysis of concrete shell roofs with two radii of curvature, and with varying thickness. This system lends itself to the analysis of any structure of any shape and with varying loading and varying thicknesses. The radii need not be a constant mathematical equation.

We obtained the solution to the partial differential equations of elasticity by a successive approximation method. These equations were first formulated in their most general way in 1888 by A. E. Love. Two of these equations are of the second order, while the third is of the fourth order, involving the plate or bending terms.

I succeeded in obtaining the answer to these equations in ten weeks of working time, aided by one man. We probably did not carry the accuracy of our answer to that required for so important a structure as a dam. However, once the first convergences are obtained, subsequent refinements become progressively easier.

RICHARD R. BRADSHAW
Structural Engineer
Los Angeles, Calif.

CALENDAR

Prestressed Concrete Institute, second annual convention, Hollywood Beach Hotel, Hollywood, Fla., May 16-18.

Society for Experimental Stress Analysis, spring meeting, William Penn Hotel, Pittsburgh, Pa., May 16-18.

Building Research Institute, annual meeting, Sheraton-Brock Hotel, Niagara Falls, Ont., May 21-22.

National Society of Professional Engineers, Ambassador Hotel, Atlantic City, N. J., May 23-26.

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 28-June 2.

Steel Joist Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., May 29-30.

American Society of Civil Engineers, spring convention, University of Tennessee, Knoxville, Tenn., June 4-8.

Materials Handling Exposition, Cleveland, Ohio, June 5-8.

World Conference on Earthquake Engineering, University of California, Berkeley, June 12-16.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 17-22.

American Society of Landscape Architects, 57th annual meeting, Cleveland Hotel, Cleveland, Ohio, June 24-27.

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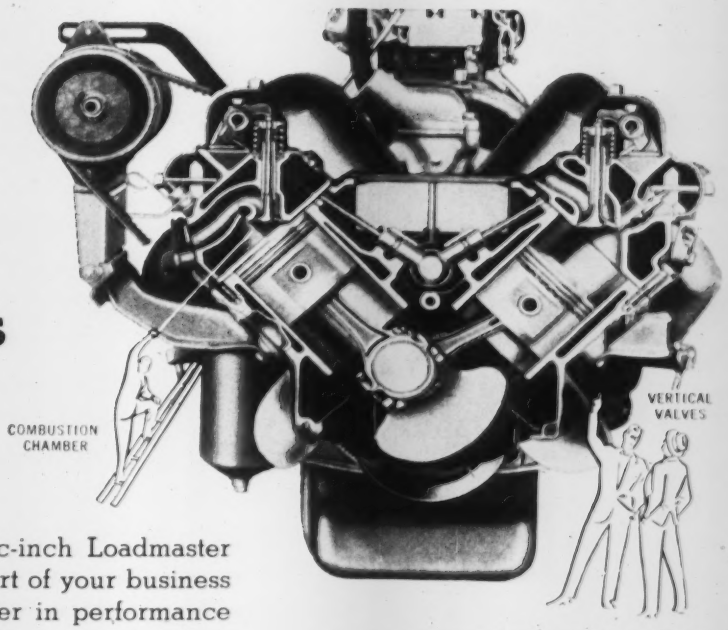

It's Chevrolet's new 322-cubic-inch Loadmaster V8 . . . and if big trucks are part of your business you'll find it has plenty to offer in performance and economy!

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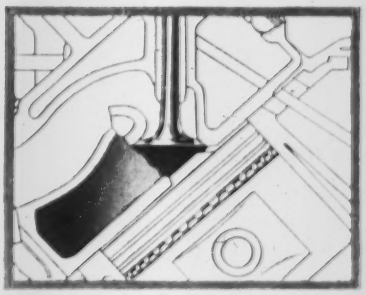
And there are many, *many* such reasons why you'll do better with this new load-pulling champ under the hood! For all the facts, see your Chevrolet dealer. . . . Chevrolet Division of General Motors, Detroit 2, Mich.



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THE CONSTRUCTION WEEK

NEW SPURS FOR MODULAR MEASURE—Efforts to promote acceptance of modular coordination—use of a 4-in. module to enable stock materials to be assembled on the job without cutting to fit—have received new impetus. The Associated General Contractors of America has become a formal sponsor of the movement along with the American Institute of Architects, the National Association of Home Builders and the Producers Council. And, the Producers Council will make it possible for individual architects, contractors and manufacturers to take an active part as a result of plans announced this week for forming a Modular Building Council.

PRIVATE RIVER CROSSINGS—If the Army Engineers approve, the Boeing Airplane Co. will build a pedestrian lift bridge across the Duwamish River to connect its main plant on one side of the river with a parking lot and accessory buildings on the other side. The 740-ft bridge, including a 125-ft lift span to permit passage of ships from Puget Sound will have a 16-ft walkway 44 ft above water.

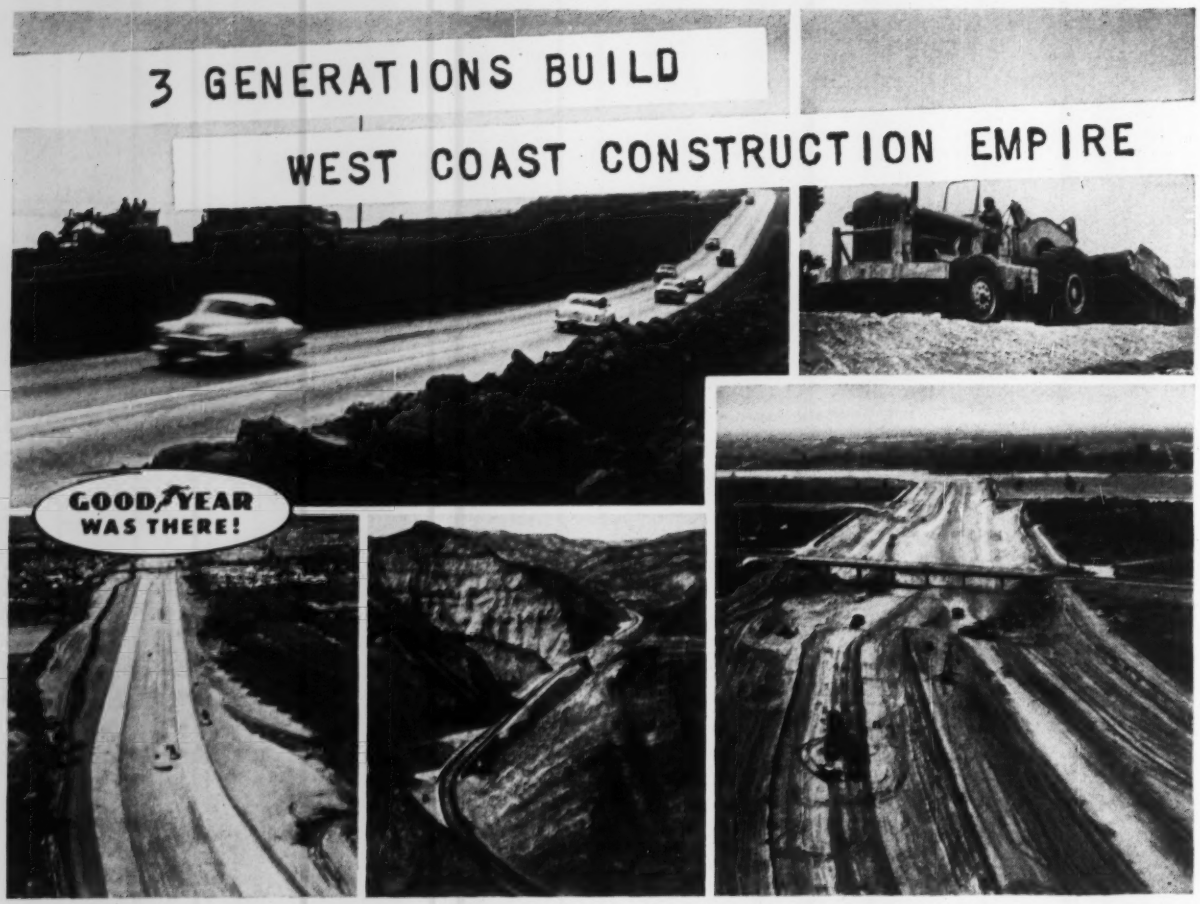
NEW OBLIGATION—A new California law requests the State Highway Commission to give weight to "community values" when selecting routes. Opponents of the legislation argued in vain that the law might seriously hamper the commission in settling route details. However, the measure also specifies that failure of the commission to comply with the requirement will not invalidate a new route adoption.

GARAGE STRAIGHTENING DELAYED—A local construction strike is delaying realignment of the Cleveland parking garage that tilted 7 ft out of plumb April 7 (ENR April 19, p. 25). Jacking operations to plumb the 8-story, lift-slab structure started April 30 (ENR May 3, p. 25). Shores and guys have been installed to prevent further tilting.

TURNPIKE REPORT—Although financial considerations may yet rule the project out or at least limit it (ENR May 10, p. 19, 27), Ohio's proposed Turnpike No. 2 (Cincinnati-Conneaut) has been found "entirely feasible in its civil engineering and construction aspects."

DAMBUILDERS' DREAM—Two hydro power sites in Alaska have a greater potential than any existing dam in the U.S., including Grand Coulee and Hoover Dams, an Army Engineer representative disclosed at a power conference sponsored by the Anchorage Chamber of Commerce. A dam in Rampart Canyon on the Yukon River would install 3,100,000 kw of low-cost power and have a reservoir of more than 9,000 sq mi, bigger than Lake Erie, and another dam at Kaltag would have nearly as much capacity.

3 GENERATIONS BUILD WEST COAST CONSTRUCTION EMPIRE



Starting 76 years ago, as a small contractor, Adolph Teichert built the versatile organization that has what it takes to lick the big ones pictured above. Today, when you see a giant West Coast job—quarrying, earth-moving, road, rail bed, military base or dam building—it's a fair bet that A. Teichert & Son, Inc., have a hand in it! Earthmover shown above has Goodyear Hard Rock Rib tires on front wheels, Hard Rock Lug on rear.

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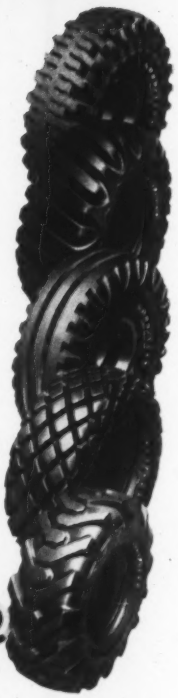
Leading equipment manufacturers have adopted Goodyear tubeless tires as standard—or will supply them as specified. Or you can convert your present equipment to Goodyear tubeless. Get the facts from your Goodyear dealer.

Goodyear, Truck Tire Dept., Akron 16, Ohio



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WASHINGTON OBSERVER

The latest tightening of money is holding down housing starts according to the housing subcommittee of the House headed by Rep. Albert Rains (D-Ala.). Figures for April show no improvement over March—they're running at an annual rate of 1.1-million, compared with the 1.3-1.4-million rate at this time last year (see p. 178).

The group says we can't have 1.3-million starts this year—the goal of Housing Administrator Cole—if the Federal Reserve Board's latest increase in the discount rate is allowed to remain in force.

Rains wants to liberalize Fannie Mae rules to ease mortgage money. He would have FNMA make standby commitments to builders in tight money areas, make it easier for lenders to transfer loans to the agency, and give FNMA more money for low-cost housing.

Rains would put 10% of GI insurance reserves in mortgages. This would add about $500-million to the money supply for housing.

•

Size of the highway construction bill may hinge on this week's stand by Sec. of Treasury George M. Humphrey. He's not worried about the amount of spending in itself, nor about the tax rates which will be voted to finance the new billions in roadbuilding.

Humphrey wants to be sure spending never outruns income being put into the trust fund from user taxes. For the first few years income would exceed outgo—but for a number of years both the House bill and the Gore Bill call for spending in anticipation of greater tax revenues to be derived, partly from increased use of the new highways. There would be a few years in which the government would have to borrow to finance the building.

A victory for Humphrey would slow down and stretch out the program.

•

Chances for a federal flood insurance program are brighter this week now that the Senate has passed a bill. Next step is for the House Banking and Currency Committee to thrash out a bill it can approve out of the 44 measures it has to consider.

The Senate's measure stocks close to flood damage only, whereas the House versions spread out to cover damage from such things as atomic blast and other types of disasters.

The maximum insurance for any one person or company would be $250,000 under the Senate bill. For dwellings the maximum would be $10,000 for the house and everything that goes with it. There's a "deductible" provision, too, which says the government needn't pay the first $100 of any loss nor 5% of the rest of the claim. A new agency would be set up to administer the program.

The House committee isn't likely to get going until mid-June. Reason: It has other business—including housing legislation—to dispose of first.

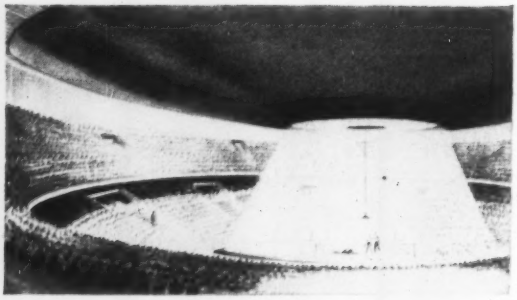
•

TVA has won a round in the fight over how it spends its revenues on construction. A House-Senate conference committee has agreed by close vote to let the Tennessee Valley Authority spend power revenues on an additional $3.5 million unit at the John Sevier steam plant in northeast Tennessee.

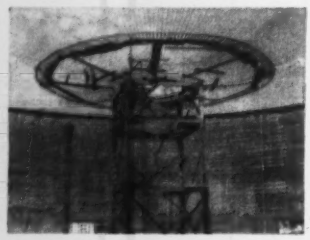
But the battle isn't over. There still could be a floor fight in the House where opponents may try to toss its agreement back into the lap of the House-Senate conference committee.

It's all a question of what is to be considered "new" construction. A 1948 rider on TVA appropriations said that the agency must go to Congress for appropriation of money on any "new" projects.

Breathtaking *isn't too strong a word...*

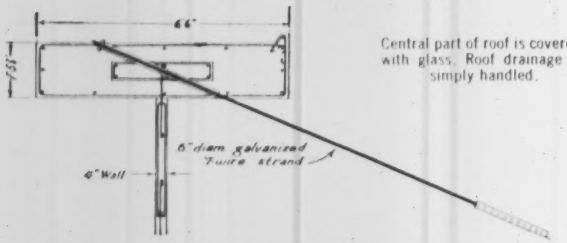


for this 83-ft.-high, 310-ft.-diameter concrete stadium, with 4-in.-thick wall and 850-ton suspended prestressed roof . . .



4"-thick wall was concreted with 'Incor'. forms lifted daily. Roof is supported by cables extending from concrete ring atop wall to steel ring at roof's center.

Roof consists of 9000 concrete slabs 2" thick, hooked to cables; prestressed by overloading with brick, then concreting joints, later removing overload.



Central part of roof is covered with glass. Roof drainage is simply handled.

● Montevideo's cylindrical concrete stadium, to seat 20,000, is a masterpiece of simplicity and economy. Wall was built by lift-form method, using 'Incor'* 24-Hour Cement, produced by Lone Star's Uruguayan subsidiary, for speed, economy, quality.

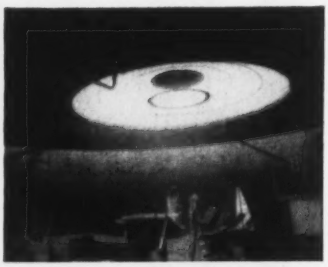
Roof, built without forms or falsework, is supported on 256 seven-strand cables, strung between a ring 6 ft. 6 in. wide and 1 ft. 5¾ in. thick, concreted around top of wall, and an 18-ft.-diameter steel ring at roof's center.

Working out from center, 9,000 precast concrete slabs, 2 in. thick, with reinforcing rods projecting laterally and shaped into hooks, were fastened to the cables. Roof was then prestressed by overloading 50%, placing concrete in slab joints, and removing overload after concrete had hardened.

Central part of roof (65 ft. diameter) was left open and covered with glass, as was a strip next to wall, to provide light and ventilation and to minimize wind suction.

Talk about simplicity! Clearly, the designers solved their problems by taking fullest advantage of concrete's great flexibility and "doing what comes naturally".

*Reg. U.S. Pat. Off.



STADIUM, MONTEVIDEO, URUGUAY

Designed and built by:
MONDINO Y VIERA, LTDA.

Consultants:
ALBERTO S. MILLER, C.E.
and
LUCAS RIOS
Architect

Consulting Engineers, Roof Design:
THE PRELOAD COMPANY, INC.
New York

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$3 billion in new business is forecast as . . .

Military Housing Gets Into High Gear

Building of privately-financed family housing for military personnel should develop some $3 billion worth of construction business in the next two years. That is the outlook in Washington this week as Congress took initial steps toward doubling a 100,000-unit mortgage insurance authorization that is only nine months old.

To a construction industry that has been steadily reducing its output of new homes—April housing starts announced this week were down to an estimated annual rate of 1,110,000 (see page 178) this prospect of 200,000 additional units might seem a welcome boon. Manufacturers, suppliers and contractors—as well as the military services—certainly regard it as such. But many homebuilders and real estate people will not benefit and oppose any program that provides houses on military bases and thus takes service families out of the local housing market.

• Fast Action by Agencies

Fast action by the military departments has impressed Congress with the effectiveness of this latest attempt to produce desirable homes for the families of career personnel and thereby encourage reenlistment of key men. Superseding the earlier Wherry Act program, this much more liberal and financially attractive plan—introduced by Sen. Homer Capehart of Indiana and enacted last August—has already brought some quick results in getting projects approved, designed and ready for bids.

First, the affected agencies—Defense and the Federal Housing Administration—had to put together an agreed-upon set of rules to govern the new program. They made speed on that job. Four months after the law was signed, the military and FHA had set up the criteria, procedures and contract forms for a fast-moving operation. The Defense Department hoped to get 100,000 family units under contract or commitment by Sept. 30 of this year. FHA was a little more conservative, but thought good teamwork would line up 80,000 by the closing date for the first year's trial run of the new legislation.

In the brief five months since procedures were established, the military services have obtained Defense Department approval of 160 projects containing 65,000 units. This approval certifies a project for award of an architect-engineer contract to produce the plans and specifications for the job.

Most of the projects go out for design about two weeks after the Defense Department approves them. Design contracts are speedily negotiated with A-E firms in the states or areas where the housing is to be built.

Design of some 25 projects has been speeded by base commanders and district offices of the Corps of Engineers and Navy Department through utilization of previously prepared plans for Wherry projects that never got under construction. Where possible, the contracting officers negotiate with the same A-E firms that produced unused Wherry plans and authorize these outfits to revise and improve the earlier project designs to fit the higher standards and increased cost limits under the new program.

This procedure enables the government to recoup the cost of the earlier plans. But it is not always possible to adapt the earlier lower-cost housing to the improved concept. However, many A-E firms, starting from scratch, have been able to turn out completely new plans and specifications almost as rapidly as organizations which had to rework old designs. Of course the cost of an entirely new design is considerably higher than adaption of existing plans.

• Local Speed-ups too

Speedy action by base commanders and Army district engineers, followed up by fast processing through FHA regional offices and top echelons of the Defense Department and FHA in Washington, makes it look as if the cooperating agencies might come close to their Sept. 30 goal. Already, one big project in Texas is under construction, the low bidder was announced last week for another in North Carolina and bids are being opened this week for a third multi-million dollar job in Florida. These three total more than $20 million.

Bid openings already held, however, merely set the pitch for greater activity that will reach a crescendo in the next few months. Scheduled for advertising this month are seven additional Capehart housing projects in six states with a total potential value exceeding $44 million. The fast pace of advertising and award of new projects will increase through June, July and August.

Capehart's substitute for the languishing Wherry program gave a double incentive to builders and investors that the old effort lacked. The Defense Department backed the new plan because it had to find some means of producing attractive housing for highly trained and almost indispensable men who are leaving the military services in increasing numbers.

Like all other agencies, the Defense Dept. knows that the cheapest way to build government structures is with federal funds appropriated by Congress. But no one was willing to increase the national debt by $3 billion in order to construct the 274,000 family units immediately needed for married personnel of the officer and upper enlisted grades. Accordingly, Congress and Defense officials united in support of Capehart's new plan.

• It Appeals to Contractors

To construction contractors, the plan has direct appeal. It enables them to perform their normal function as builders and to pull off the site free and clear upon completion of the project, which is turned over to the military for operation, maintenance and payment of the mortgage loan.

Likewise, to investors, the Capehart project offers double-riveted government guaranties. Under a pledge of federal faith, the lender has double assurance that the loan will be repaid in full with 4% interest in 25 years or possibly less, but in no case can the government take the mortgage from the lender in less than six years by paying off the balance.

For the government, the projects involve but one risk—the possible closing of the military base or reduction of personnel to unexpected low levels. Otherwise, the military has assurance of fixed income from the

housing. They assign military families to the units and collect the rent in the form of quarters allowances appropriated each year by Congress.

Last year's law set a limit of $13,500 as the average unit cost per project, including outside utilities, streets and sidewalks, or $16,500 in Alaska, Hawaii and Guam. For greater flexibility in meeting needs of service families and balancing the overall programs of the Army, Navy and Air Force, the Defense Dept. this year is asking Congress to set a $16,500 top limit applicable everywhere and to make an increased average cost of $15,000 apply throughout each of the three services, instead of to individual projects with only 10 or 20 units. The higher and more flexible levels would permit construction of housing that more nearly compares with service homes financed out of appropriated funds.

• Here's How It Works

How the program actually operates is best illustrated by what went on in getting the first project under construction. This $12.5-million job to build 944 housing units—332 singles and 306 doubles—on 130 acres at Abilene AFB was awarded to the lowest of eleven bidders, a joint venture made up of C. H. Leavell & Co. and Dan R. Ponder, Inc., an El Paso team that had often worked together in the past.

Many things gave this combination the necessary slight edge to beat out the tough competition. But their greatest asset, in addition to good organizations with plenty of construction savvy, was a long and valuable experience in financing new developments. Their previous joint-venture activity in building three Wherry projects totaling 1,800 units in New Mexico and Texas that they still own—and owe on—was not the least valuable part of this advance training. But other work on mortgage-financed developments—and a high credit standing at the banks as a result of all their operations—were even more important.

Charles Leavell and Dan Ponder had no advance notice of the Abilene project. They got to work on it only after the Air Force advertised for bids. By that time, another joint venture of Texas architects had refurbished and expanded plans started two years earlier for a Wherry project at Abilene that never bloomed.

In making out their bid, Leavell and Ponder had to figure all the ordinary costs of labor and materials. In addition—and this was the factor that made the difference—they had to settle on a figure for the cost of borrowing money. As Ponder points out, this is the item that can win or lose the contract for a Capehart project.

For the construction contractor on these jobs had to find the money to build the project. It is up to him to line up investors who will take the mortgage when the last of the houses is occupied. Even more important, the bidder must attempt to determine what the investors or investment group will agree to pay for the mortgage a few months in the future when the day comes to close the deal among the parties: the military service, the FHA (which insures the mortgage 100%), the lender and contractor. This closing, naturally, will take place only if the contractor enters the lowest acceptable bid.

Along with the permanent financing, the interested contractor must at the same time try to get a firm figure, or estimate as closely as possible, what his interim financing during construction will cost him. These construction loans, under Capehart project procedure, must be backed up by the permanent investors who take the mortgage. Monthly construction payments to the contractor are guaranteed by FHA.

Ordinarily bids are opened 30 days after advertising, but Abilene bidders were given 40 days, to Jan. 26, because the Christmas holidays intervened.

Leavell and Ponder were low with just under $12.5 million. The second bid was only $100,000 higher, and the third topped the second by just $140,000.

Thus all three leading bidders were only 1% apart. In fact, five of the competing bidders were grouped closely at the top of the list. It is significant that all five were construction firms with a background in financing development projects. All knew their way around in the money markets.

• The Risks Are Calculated

Leavell and Ponder quite possibly did closer figuring on financing costs than any of the others. To do so, they had to take a substantial risk. In the unpredictable but rising money market of the winter months, bankers and investors were loath to quote possible rates that they might charge later if the joint venture succeeded in getting the contract.

But the joint bidders took a calculated risk and won out on the results. Named the "eligible builder" after their low bid had passed the scrutiny of all government agencies involved, the firm was given 30 days to firm up financing arrangements made in advance.

Within that period, the contractors had assurance of construction funds to come mainly from the Guaranty Trust Co. of New York, arranged by the State National Bank, El Paso correspondent for the New York bank. And they got confirmation of permanent mortgage loan funds from two solid investors, lined up by the contractor's mortgage banker.

Because of the size of the project, the 130-acre site is split down the middle for mortgage financing purposes, one half as security for a $6.4-million mortgage and the other half for a loan close to $6.1 million. Leavell and Ponder went to Pringle-Hurd & Co. of New York the leading broker in government-backed mortgages to get these loans placed at the best possible price.

How well investors like the twice-guaranteed mortgages is shown by the results. The two mortgages were bought at two points above par (102) by conservative investors. One was taken by the Carnegie Foundation, with J. P. Morgan & Co. as agent; the other, by a group of trusts and retirement funds headed by Yale University as agent, though the loan was arranged in this case also by the Morgan firm.

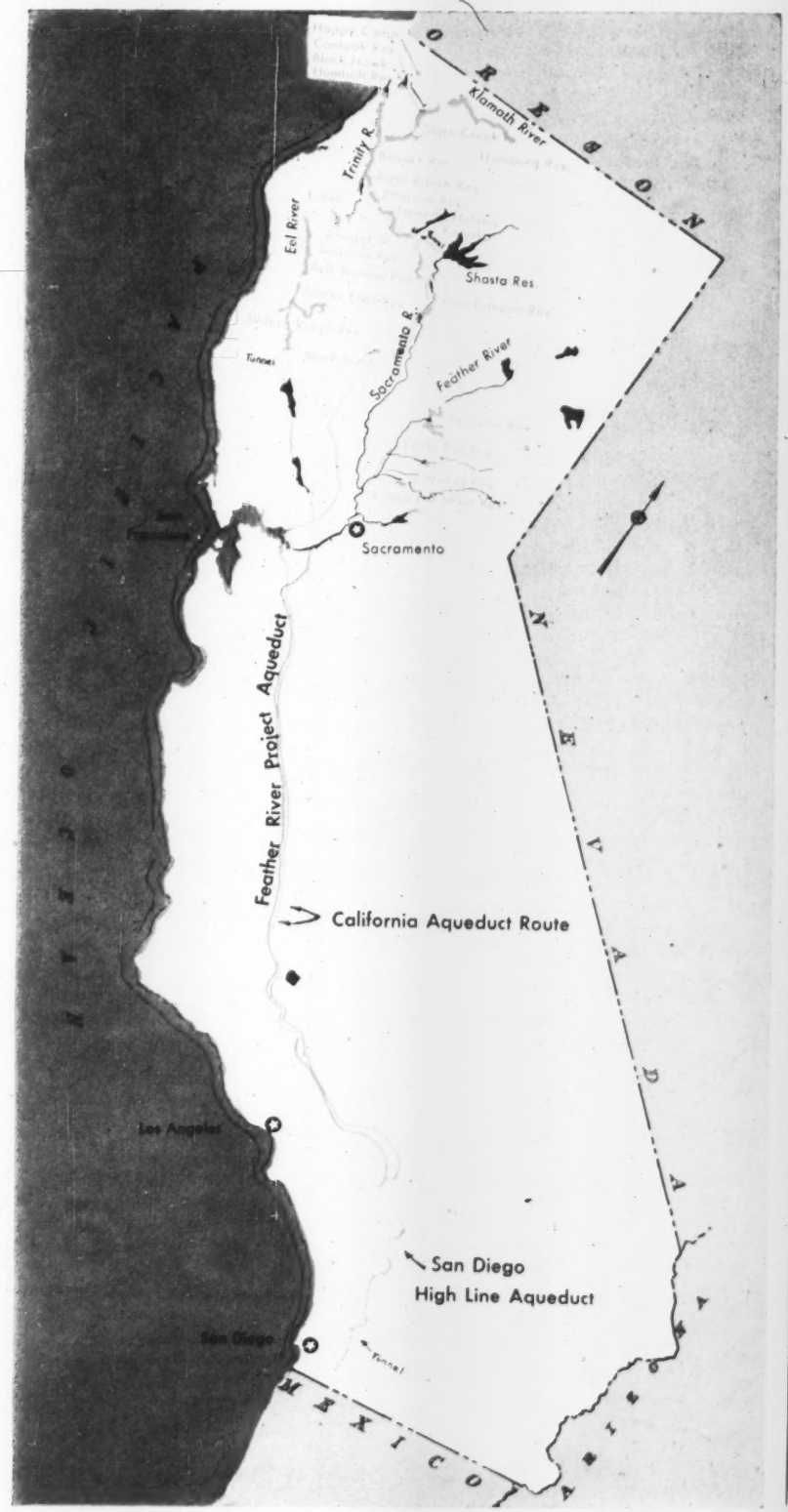
Getting $102 instead of $100 for the mortgages gave Leavell and Ponder a $150,000 margin that had been reflected in their bid, making it possible for them to offer the lowest construction price among eleven contenders.

What they pay for construction money, Leavell and Ponder don't say, but FHA increased its extremely conservative estimate of this financing cost from 1% to 1½% for this $12.5-million project to be completed in 370 days. FHA likewise stepped up its allowance for the cost of developing permanent financing from 2% to 3%.

These changes delayed the final closing to March 27. On that date Leavell and Ponder in particular and the other parties in general affixed 5,800 signatures to documents and plans. Since then dirt has been flying and concrete has been flowing at Abilene. These and the other customary operations of a construction job are going like clockwork, working toward 16 completions a day at the peak of the project.

Stripped of red tape and other requirements that surround any government project, this is the way a Capehart job gets going. To the credit of the government agencies responsible, their officials and field representatives are really pushing to unwind the red tape rapidly and clear the way for fast action by the people who have to finance and build the housing.

California Unwraps Its Big Water Plan



The wraps are off California's water plan. Pegged at $11.3 billion, it is a master plan for all future water resource development in California. It results from nine years of study, and it attacks the state's overall problem—water surplus in the north and water scarcity in the central and southern parts—whereas the existing Central Valley Project and the planned Feather River Project have been aimed at solving the problem only in part.

The report now released is labeled "preliminary." It had been circulating for review and comment when pressure was brought for its general release. Modifications yet to come may or may not be major, but the final version is sure to follow the broad brush strokes that characterize the preliminary report.

Release of the report may be one of the last major acts of the State Water Resources Board which is reduced to an advisory capacity when the new State Department of Water Resources comes into official being on July 5 (ENR Apr. 19, p. 29). The report was written under the direction of three state engineers (whose jobs will be abolished when the governor appoints the new department's director): Edward Hyatt, A. D. Edmonston and Harvey O. Banks.

As a master plan, the program attempts to coordinate water needs of all areas of the state. In so doing it proposes many new works and takes into account all existing works—including the Central Valley Project with its current construction on Monticello and Trinity River divisions. The already authorized Feather River Project is included as a part of the plan. And the report also takes note of possible future impact of such things as atomic energy, salt water conversion and sewage reclamation.

Basically the report is a study of engineering feasibility. Although costs of the various features of the plan are estimated, no attempt has yet been made to assess financial feasibility—except that authorized features like

Statewide scheme for full water utilization involves damming coastal streams in the north, transmitting water to the south. Interbasin diversions are entirely intrastate. Feather River Project is but a part of over-all, long-range plan.

. . . California's water plan

the Feather River Project have been subjected to such studies. Actually, the report indicates that some phases of the work may never become financially feasible. But they are included with the thought that the economy of the state in the distant future could conceivably change standards by which present financial feasibilities are figured.

One of the more significant aspects of the new plan is that developments are programmed within each area of the state to take care of the needs of that area. In areas of scarcity, full development of remaining potential is outlined. And in areas of surplus, as much water as the area can use is provided before assigning the rest for export. This will go a long way toward developing public acceptance of the plan.

The plan can be divided in two parts: (1) Features to satisfy local needs (240 reservoirs to store 14,000,000 acre-ft), (2) interbasin projects involving transport of water over long distances. This latter part is called the California Aqueduct System; its cost is assessed at $8.6 billion of the $11.3-billion total.

The California Aqueduct System would involve construction of 33 major reservoirs totaling more than 48,000,000 acre-ft of capacity. These 33 units would develop about 21,500,000 acre-ft of water per season from northern California surpluses for transport elsewhere. More than half of this would come from such north coastal area rivers as the Klamath, Trinity and Eel. And most of the rest will come from the Sacramento River Basin. In the main these waters would be used as follows: San Francisco Bay area—2,300,000 acre-ft; Central Coastal Area (Los Angeles to San Diego)—2,900,000 acre-ft; San Joaquin Valley—7,900,000 acre-ft; and the Southern California inland desert areas—6,300,000 acre-ft.

In addition to the major reservoirs, the California Aqueduct System is a complex arrangement of conduits that will carry water from north to south. The major part of it is a double water course from just below Shasta Dam to a terminus near San Bernardino. From the Sacramento-San Joaquin River Delta area it also includes the Feather River Project Aqueduct. And it includes branch lines to coastal areas as well as several distribution lines in Southern California. One of these latter is a second San Diego Aqueduct.

Oroville Dam—a Feather River Project feature—is the most costly dam listed in the plan. This 750-ft concrete structure on the Feather River is pegged at $474 million. But two other proposed dams rival and surpass Oroville Dam in height, if not in cost. Beaver Dam on the Trinity River is planned as a 730-ft-high concrete gravity structure costing $165-million. And Slate Creek Dam on the Klamath River is tentatively planned as a 775-ft-high rockfill estimated at $151 million.

(The 775-ft height is not an error. It is an ambitious part of the California water plan, inserted by planners who believe that by the time it is built such an unusually high rockfill will have been proven practical.)

But the most costly elements are the conduits. Big Flat Tunnel that will carry water from the Klamath-Trinity River watershed to the Sacramento Valley is estimated at $823 million. This will actually be two parallel tunnels both 35 mi long. One will be 23.4-ft dia and the other 33.4-ft dia. The Sacramento West Side Canal is pegged at $293 million. This double conduit will have 15,000 cfs capacity for 146 mi and 18,000 cfs capacity for 21.5 mi.

Taking the California Aqueduct System 56 mi through the Delta region at 17,000 cfs capacity is expected to cost $212 million. And the two conduits that run 235 mi down the San Joaquin Valley at a total capacity of 15,000 cfs are set at $504 million. This does not include the San Joaquin Valley part of Feather River Aqueduct figured at $115 million for 264 mi.

The Tehachapi Mountain Crossing is another high cost item. The 127-mi upper aqueduct (part of the Feather River Project) will cost $394 million. And the 169-mi lower aqueduct is estimated at a whopping $1.2 billion. Both these mountain crossings include extensive pumping installations.

Finally the various lines in Southern California totaling 410 mi and varying from 500 to 4,680 cfs capacity are estimated at $865 million.

Total installed power capacity at the 270 reservoirs is set at 7,000,000 kw with a seasonal production of 31.6 billion kwh. But the pumping plants will require 56 billion kwh a year. It is noted in the report that 22 billion kwh of this is "needed only for conveyance of water to certain distant desert areas, the development of which cannot be foreseen at the present time."

The report recommends that the legislature adopt the plan with components authorized for construction when their financial feasibility is demonstrated. It also urges that the Feather River Project be expedited. And it asks that adequate funds be provided on an assured and continuing basis to further design and economic feasibility studies as well as keep the plan up to date.

W. A. Johnson Dies

First president of Beavers was builder of Shasta Dam

William Arthur Johnson, 71, contractor and head of the joint venture which built northern California's $336 million Shasta Dam in the late 1930s, died at his home in Balboa, Calif. on May 10. He had just recently finished a term as the first president of the Beavers, new organization of West Coast constructors.

Born in Ord, Neb., Johnson spent most of his life in southern California, where he organized and directed a number of heavy construction and housing enterprises.

In 1922 he purchased Western Reinforced Pipe Co. of Los Angeles, merging in 1929 with Bent Concrete Pipe Co. to form American Concrete Pipe and Construction Co. of Los Angeles. He served as president until 1952, thereafter remaining active as board chairman.

In 1937 he helped to bring together the group of contractors that formed Pacific Constructors, Inc., successful bidders on the highly prized Shasta Dam contract in 1938.

A. B. Wood Dies

New Orleans sewer, water leader was pump designer

A. Baldwin Wood, general superintendent of the Sewerage and Water Board of New Orleans and a widely recognized designer of pumps, died at age 77 on May 10 of a heart attack.

An 1899 graduate of Tulane University in New Orleans, Wood first started to work on local drainage problems in the same year as assistant manager of the Drainage Commission of New Orleans. A few years later a merger produced the Sewerage and Water Board.

Wood had a total of 38 patents, of which six or eight were quite successful. In 1927 he completed the design and put into operation his 14-ft screw pumps, used to help drain the saucer-shaped city of New Orleans which could flood even after a light rainstorm.

AWWA's 75th anniversary convention warned that . . .

Too-Cheap Water Plagues Growth

Howard Jacoby
Associate Editor

Water suppliers must discard their traditional philosophy of "cheap water," if truly adequate systems are ever to be realized.

Last week's 75th anniversary meeting of the American Water Works Assn. in St. Louis heard—and welcomed—this challenge and indictment which was issued by one of its own, John H. Murdoch. The counsel for the American Water Works Service Co. minced no words in fixing responsibility for lack of sufficient growth funds directly on the waterworks industry. By failing to adopt the attitude—and convince the public—that good water at any price is a bargain, water people have only themselves to blame for the inadequacies that plague many existing systems.

Murdoch saw today's too-cheap water linked to yesterday's requirements. Central supplies were desirable for fire fighting purposes and to allay the dust of the old dirt roads. These lures alone could not attract customers having their own wells. Water also had to be sold cheaply.

But the average citizen today, intoned Murdoch, realizes the paramount importance of water that is safe and aesthetically appealing. Should it be too difficult to convince him to pay for what he insists upon?

Murdoch's plea was the main course of five days of sturdy fare served up to over 2,500 registrants at AWWA's diamond jubilee celebration.

• Design Standards Hit

The State Sanitary Engineer's Manual proposed for ten states of the Great Lakes-Upper Mississippi River Basin area was given a thorough going over. Aside from numerous technical questions, reactions to the proposed manual ranged from cautious approval to flat disapproval of the idea of setting minimum design standards. Consulting engineers, in particular lined up mainly on the negative side, pointing out that the manual would limit the freedom and initiative of the competent professional engineer since minimum requirements tend to become the only accepted standard. Consultants held that only experienced professional engineers should be designing plants, they do not require spelled-out design considerations.

Others considered the manual in the light of the caliber of the design personnel—particularly in the case of small cities. The manual was seen helping engineers doing work in the area for the first time and saving both state and designing engineers considerable time by reducing the number of changes in submitted plans and specifications.

• Federal Programs Cited

The convention considered the current highway and water pollution control bills. Harry E. Jordan, Secretary of AWWA, urged individuals to write their senators in support of that body's version of the utilities relocation section of the highway bill. As passed by the House, the bill allows federal funds for utilities relocation only in those states already reimbursing utilities. The Senate Public Works Committee, however, has substituted a relocation provision allowing up to 50% federal reimbursement in those states not now paying for utilities relocation.

Noting the imminent June 30 expiration date of the 1948 Water Pollution Control Act in an official statement, AWWA's board of directors called for speedy passage of either Senate Bill 890 or House Bill 9540 without the grants for treatment plant construction.

The question of recreational use of impounding reservoirs was answered with a resounding "No!" Led by Robert Diemer of Los Angeles, a panel cited these results if such use were allowed, even on a limited scale:

- Additional purification would be required, working special hardship on systems designed only for chlorination.
- Recreational use would be difficult to control.

PAUL WEIR, new AWWA President.

- Danger from forest fires would be multiplied.
- Sabotage would be made easier.

Proponents of recreational use of impounding reservoirs are better advised to direct their energies toward cleaning up the nation's polluted streams, ventured the panel.

Rating of waterworks systems was much discussed. While the major portion of work remains before a satisfactory system is evolved, AWWA spokesmen stated and reiterated their firm conviction that the job was not impossible and was very much worthwhile. AWWA is seen formulating the standards of evaluation, but actual rating of a specific system should be performed by those interested in doing so—the system officials themselves or other civic bodies.

• Stabilizing Limed Water

A technical highlight of the meeting was a discussion of lab and pilot plant experience with calcite stabilization of lime-softened waters by H. O. Hartung of the St. Louis County Water Co. In the laboratory, Hartung succeeded in precipitating 30 ppm and more of additional hardness by adding excess amounts of alkali-free 150 to 325-mesh calcium carbonate to lime-softened water between the final sedimentation and filtration steps. Success here promised elimination of recarbonization or sequestering of water to stabilize lime.

But over six months of field operations in a 6-mgd stabilizer has failed to resolve problems in keeping a 3% to 5% solution of calcium carbonate seeding in the proper suspension.

As would be expected during its diamond jubilee convention, AWWA kept up a steady stream of tribute to the bygone greats of the water field. Abel Wolman of Baltimore and E. Sherman Chase of Boston summed up masterfully 75 years of progress in water supply quality and engineering, each taking a few good-natured potshots at the New England and Middle Atlantic philosophies respectively. Fred G. Amadahl, Assistant Secretary for Water & Power Development, Department of the Interior, reviewed the Eisenhower Administration's water resources policy, summing it up in the word "partnership."

Succeeding Frank C. Amsbary of Lynbrook, N. Y., as President of AWWA is Paul Weir, General Manager, Water Department, Atlanta, Georgia.

Baltimore sets out to give the U. S. . . .

A New Slant on Urban Renewal

Baltimore's urban renewal program is moving into high gear with a triple-pronged attack on blight.

The latest in a series of fast-breaking developments was signing of a contract with the federal government under which the city will receive $228,240 to proceed with plans for the most completely-integrated urban renewal project that has ever been attempted under terms of the Housing Act of 1954.

Scene of the experiment is a 191-acre tract containing deteriorating row-houses situated in a once-prosperous section of the city known as Harlem Park.

In this area, the city plans to coordinate all three of its existing housing programs in a joint house-by-house approach, instead of assigning separate areas within the development to rehabilitation, redevelopment and public housing.

In the past, the three programs have worked this way:

- Public housing has consisted of large-scale development of garden apartments or high-rise apartment buildings that have been constructed either on slum-razed land or on newly-developed land.
- Redevelopment has been used to clear the slums from three sizable sites for sale to private developers, or to the city or state for construction of public facilities.
- Rehabilitation—the "Baltimore Plan"—has consisted of improvement of blighted neighborhoods by residents and landlords through strict enforcement of housing and sanitation laws and by the organization of neighborhood groups that help to stimulate and develop residents' pride in the area.

• Difficulties Were Met

Each of these programs had fundamental drawbacks when used alone.

Public housing, for example, represented a comparately high cost—estimated by Baltimore at more than $200,000 an acre for acquisition and clearance alone. Because of its cost, public housing alone could not solve the city's problem in its 6,000 acres of blight.

Redevelopment has been less costly than public housing in clearing slums, but red tape and the difficulty in attracting private capital have held clearance under this program to only 115 acres in seven years. And the redevelopment program has aroused resentment among Baltimore's housing-short Negro population because no new dwelling units have been built for Negro occupancy on the land cleared under the program.

Drawbacks of the city's rehabilitation program have been more complicated. But the basic problem has been that rehabilitation of individual houses is not always enough to reverse the decline of a neighborhood.

Baltimore discovered that even when every home in a neighborhood is brought up to the minimum standards set out in the codes, the area still can be blighted by the gridwork of through streets, a sprinkling of non-residential structures, and lack of playgrounds and recreational facilities. Property values remain low and residents' morale begins to sink quickly as soon as the city withdraws the pressure of strict code enforcement.

This was the lesson learned in the "pilot area" of East Baltimore in 1951-53, and it influenced authors of the Federal Housing Act of 1954. In fact, the former chairman of the Mayor's Committee on the Baltimore Plan—mortgage banker James W. Rouse—was chairman of the Presidential subcommittee that drew up the urban renewal sections of the 1954 act.

In Harlem Park, Baltimore feels it can overcome the handicaps encountered when the various housing programs were tried separately.

The entire 191-acre Harlem Park site will be planned as an integrated unit with provisions for traffic arteries, off-street parking, shopping centers, parks, schools and recreation centers.

Within the framework of this plan, individual houses will be rehabilitated where remodeling is economically feasible. Some houses will be condemned to make way for new improvements. And, under the city's redevelopment powers, some blighted houses may be taken over by the city, rehabilitated and sold.

• New Look in Housing

Public housing in Harlem Park will have a new look. Instead of building large garden-type developments or high-rise apartment buildings, the Housing Authority plans to build small groups of houses, scattered throughout the area and designed to blend with the rest of the neighborhood. Public housing powers also may be used to take over blighted houses and rehabilitate them for rental to low-income tenants.

To overcome the scarcity of capital for redevelopment, Baltimore builders and FHA officials are counting on Section 220 of the Housing Act of 1954. Under this section, FHA would guarantee financing in the urban renewal area on the same basis that it now guarantees home improvements in well-maintained, stable neighborhoods.

• It's Only the Beginning

While the Harlem Park experiment will be watched closely by urban renewal experts throughout the nation, it is only part of Baltimore's new crusade against blight.

The long-stalled Broadway Redevelopment project, for example, is now nearing the construction stage with a federal allocation of $3.5 million approved.

This involves construction of a "residential campus" for Johns Hopkins Hospital and recreational facilities for a Negro high school on land that has been cleared of slums.

And, a second Baltimore redevelopment project has won a federal allocation of $4.4 million. This one, on the northwest fringe of the downtown area, consists principally of an $11-million state office building center.

Federal aid is sparking a third project. A federal allocation of $58,000 for advance planning is expected to lead to redevelopment of the slum area that lies between the historic Camden Station of the Baltimore & Ohio Railroad and the new Baltimore-Washington Expressway. This project is significant because it will be the first slum-clearance project in the city that will make the land available for redevelopment by heavy industry.

Montgomery Gets Federal Aid For Urban Renewal Project

Montgomery, Ala., has received a $1.3-million grant and a $2.2-million temporary loan from the federal government to help the city launch a major urban renewal project.

The city plans to raze nearly 450 substandard houses as the first stage of its Houston Hill project. The cleared land would be used for a new city auditorium, public park and swimming pool, and parking facilities. Part of the cleared land would be redeveloped for business and light industry and 60 private residential plots would be included.

Public housing will be tied into the project through construction of an additional 320 low-income units adjoining the existing Victor Tulane Courts. Another site, south of the city, has been acquired to provide homes for some of the families now living in the slum area.

City planners meet, disagree on . . .

The Future of Downtown Areas

In an aura of healthy disagreement and controversy the American Institute of Planners staged their annual meeting in Providence, R. I. last week.

In three days of sessions, the city planners:

- Praised and attacked architect Victor Gruen's plans for complete reconstruction of downtown Fort Worth.
- Argued that cities are taking a "backward" approach to solving the traffic congestion problem and should plan living and working areas as close units.
- But also argued that despite such planning, people will live where they wish and so must have sufficient facilities to connect their homes with their work.

It was agreed, however, that curb parking in downtown urban areas must be eliminated.

• Center shopping district—Gruen's idea of a 300-acre central shopping area as the heart of a city—Fort Worth, in this case—with no streets running through it, but underlain by parking areas and served by a circumferential belt road, got high praise as the biggest idea to hit urban planning in many years.

But there were some brickbats thrown too. Edgar M. Horwood, professor of planning at the University of Washington, said Gruen's plan is in error in one major respect—it overlooks the fact, he commented, that a central city must provide more than a shopping center—it must provide space for offices and government buildings, banks, courts and the like. And the people who come to work in these establishments have little interest as a daily matter, in shopping areas.

• Backward or forward?—The idea that cities are attacking their congestion problems backwards was advanced by Ladislas Segoe, a Cincinnati consultant.

According to Segoe, "(Cities) will never catch up with the traffic problem until (they) solve its cause. The cause is the great distance between where people live and where they work. The two-a-day movement between these areas will be minimized in the future, by planning living and working areas closer together, not by building bigger and bigger expressways to handle the load."

Not so, according to Lawrence Moore, New Haven consultant. Said Moore, "It is unrealistic to think you can push people around and tell them where to live and where to work, and keep them there."

• Big problem—Walter H. Blucher, newly-elected president of the institute, stepped into the discussion to emphasize that free movement to and from work, and within urban areas is the major problem facing urban designers.

He said that, with the U. S. population expected to double in the next 50 years and because most of this increase will be in the cities, the biggest job will be to provide easy movement. "This means more and better highways, more terminal parking areas, and better and more rapid mass transit.

"That transit, in all probability, will have to be subsidized by state and local governments."

• Other points—Other points brought out in the sessions included the need for planning by cities with an eye to neighboring communities and other agencies, to prevent "building roads in the wrong place"; to prevent water shortages and sewage disposal problems, and the like.

Another, and serious, matter is a shortage of trained planners. AIP estimated that more than 300 planning jobs—many of them offering salaries of $6,000 or more per year to start—are going begging throughout the country.

State Plans Lag Behind Highway Bill

The realization that passage of the federal highway bill by this session of Congress will pose the greatest challenge ever faced by highway engineers and builders was clearly evident in deliberations at the annual meeting of the National Highway Users Conference in the nation's capital last week.

The more than 500 delegates—representing the many public and business-interest groups that make up NHUC—who attended heard some sobering facts. Key among them was that the $51-billion expenditure planned would be the second largest single undertaking ever entered by the United States. (The first, in point of cost, being World War II.)

And it became apparent through panel discussions, speeches, comments from the floor and dinner-table conversation that the states have been laboring under a handicap of uncertainty that has prevented much real planning. If the measures now before Congress get through in substantially their present form, the highway segment of construction will have a lot of catching up to do.

Not that anyone at the meeting doubted that the challenge could be met once legislation has been placed on the books.

But in the welter of fact-gathering that has gone on over the past several years, these two factors seem to have been slighted: Statistically, it has been proved that there is enough capacity to build the roads under a new program, and that engineering forces can somehow be stretched to plan it. But the states' engineering plans that will be necessary before the big earth-movers can get to work, and acquisition of right of way for the new roads haven't been carried forward. And some basic points of standards that are the business of the federal government haven't been settled. And they'll take some time to settle.

NHUC delegates stressed these developments as necessary to proper state action:

- Fastest action possible by the Congress, so that states may know the exact boundaries of the task that is before them—how much money will be available on what schedule, and under what conditions.
- Quick determination by the Bureau of Public Roads of paving, subgrade, width and engineering standards; settlement of the limited-access vs. free-access issue and development of standards for access that will do the least possible damage to local businesses and still provide adequate service for motorists.
- Uniform—or at least codified—state laws controlling traffic on the interstate system. And uniform taxing by the states.
- A continuing program of public education to keep public interest at a high pitch, supply backing for state highway organizations in their efforts to get better staffs, better cooperation.
- Under no circumstances should what one speaker called "the other 3,260,000 miles of roads" be neglected while so much attention is being focused on the 40,000-mile interstate system.

At closing sessions of the meeting it was announced that William S. Richardson, president of the B. F. Goodrich Co., had been elected Chairman of NHUC he succeeds Albert Bradley, chairman of the board of the General Motors Corp., who had headed NHUC since 1948.

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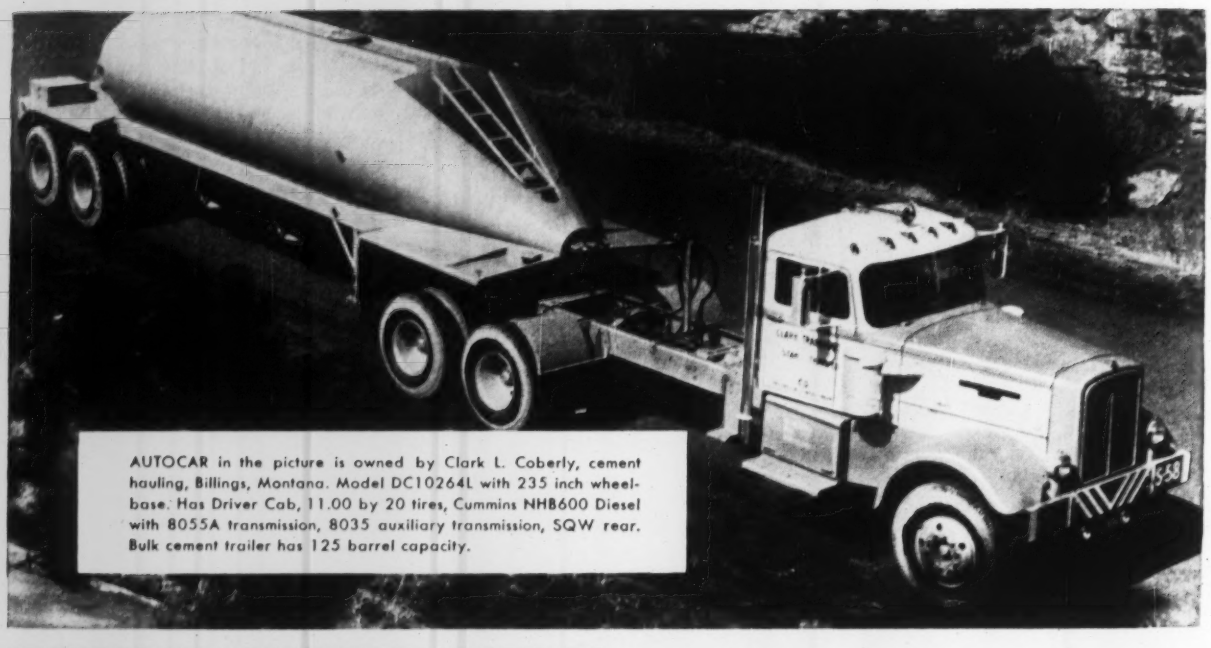

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Ease the Impact

Pennsylvania studies ways to cut down flood damage

The State of Pennsylvania has launched an extensive study of ways and means of lessening the economic impact of floods.

Public subsidies or indemnities for flood victims will receive primary attention of a 14-member committee appointed by Gov. Leader.

Five major watersheds will be surveyed by the group, which hopes to submit recommendations to the 1957 legislative session.

Bradford Smith Jr., vice president of the Insurance Company of North America and chairman of the committee, told the group "it is the duty of private enterprise to move in on the problem to the fullest extent of its possibilities."

Flood insurance is not feasible on a self-sustaining basis—just as war damage insurance cannot be effective without government cooperation.

Three subcommittees were set up. A flood control group, headed by State Secretary of Forests and Waters Maurice K. Goddard, will report, by river basins, on the predictability, occurrence, damage and control of floods.

Value of property subject to flood damage, possibility of private insurance, and the possibility of government subsidies or indemnities will be studied by an actuarial task force.

Cong. William J. Green Jr. (D-Pa.) will lead a survey into the activities of the federal government and other states on the flood loss and insurance problems.

Charlotte, N. C. Approves $6-Million Water Program

The Charlotte, N. C., City Council last month approved a $6-million municipal water expansion program, the first phase of which will include the construction of a new filter plant with 12-mgd capacity on a 70-acre tract that is situated on the western edge of the city.

Also included in the first phase of the project is the laying of a 42-in. distribution main from the Hoskins Reservoir to the Oakdale filter plant and from there to Camp Greene Street and Thrift Road, tying in with an existing 42-in. main.

The plans are designed to permit future additions to bring the total capacity to 72 mgd. The first 12-mgd plant will supplement the existing filter plant which is located on Beatty's Ford Road.

Part of the $6-million water bond issue will be used also to extend the distribution system and help eliminate these shortages.

Plans and specifications for the expansion program were prepared by J. N. Pease and Co., Charlotte, architects and engineers; construction bids will be asked as soon as the plans are approved by the N. C. State Board of Health.

Richmond-San Rafael Bridge Open for Traffic by Sept. 1

The Richmond-San Rafael Bridge across San Francisco Bay will be opened Sept. 1, California Gov. Goodwin J. Knight announced the opening date, declaring it will be open in time to serve for the Labor Day weekend and for the latter part of the heavy summer traffic.

The upper deck will be the first to be opened to traffic, to be followed approximately a year later by completion of the lower deck.

The $68-million bridge, originally scheduled for opening in October, will connect Contra Costa and Marin Counties (ENR March 29, p. 42). Under agreement between the state and the Richmond-San Rafael Ferry Co, the ferry boats will cease operation within five days after opening of the bridge.

Rolling Sewers

Tank trucks haul wastes to reduce pollution of stream

Large tank trucks serve for in-process industrial waste disposal at a paper mill in Yorklyn, Del. They carry away 16,000 gal daily of a caustic detergent solution that contains practically all of the plant's pollution load. The mill's remaining 1 mgd of waste water can be deposited untreated into nearby Red Clay Creek with little harmful effect.

Diverting just this small amount will remove about 80% of the pollution load in the stream and also raises the hope that by summer, some form of life in the stream can be sustained.

The National Vulcanized Fibre Co. runs four trips a day to Newark, Del., 12 mi away, where the so-called digestor liquor is deposited into an intercepting sewer leading to a treatment plant. The mill adopted the unique trucking method upon the advice of the State Water Pollution Commission.

Both parties agreed that extension of the Newark intercepting sewers to Yorklyn was economically feasible but undesirable considering the plant's 1 mgd effluent represents 25% of the stream's total dry-season flow.

City With a Thirst

Trinity River project will help satisfy Dallas' needs

Another water supply system on the Trinity River in the Dallas, Texas, area—good for 35 mgd—will be ready for use by the end of this year.

The North Texas Municipal Water District, under the direction of A. P. Rollins, is pushing the laying of transmission mains from Lavon Reservoir on the easternmost branch of the Trinity to eleven cities, including Dallas. Other current work includes a 40-mgd filter plant and 35-mgd pumping station at Lake Lavon.

Filtered water will be split 15 mgd for Dallas and the remainder, probably 12 mgd at the start, to the other towns.

The latest source now contains more water than the three other reservoirs on branches of the Trinity River—Grapevine, Garza-Little Elm and Benbrook—and old Lake Dallas combined. All the newer lakes were formed by Corps of Engineers dams built primarily for flood control.

The Lavon supply will have a major effect in satisfying the thirst of the smaller north Texas towns and will be an important link in Dallas plans, at least until Sabine River water becomes available. Early this year Dallas voters approved a $20 million plan for an eventual 160 mgd to be delivered from this source (ENR Feb. 23, p. 34).

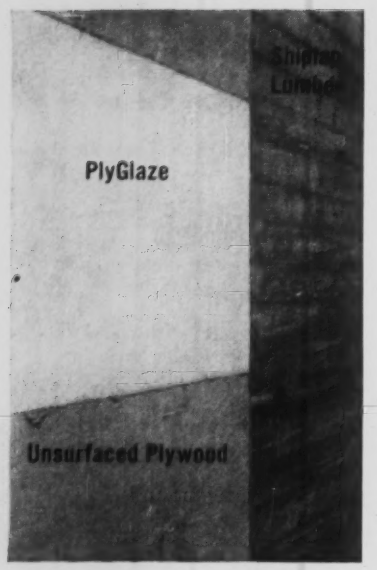
Dallas presently draws its water from badly silted Lake Dallas, Garza-Little Elm Reservoir, the Red River and from a number of deep wells within the city.

Economic Feasibility Study Of $200-Million Dam Underway

The Chelan County PUD of Wenatchee, Wash., has received a state water-right permit for its proposed Rocky Reach Dam on the Columbia River above Wenatchee. Studies on economic feasibility of the $200-million project are under way by R. W. Beck & Associates, Seattle consulting engineers. Provided these are favorable, application will be made to the FPC for a construction permit.

Plans call for initial installation of seven 90,000-kw generators, with provision for the later installation of four more units. Power not required by the PUD would be marketed by the Puget Sound Power & Light Co. of Seattle.

A concrete gravity dam, creating a reservoir nearly 43 mi long, would have a 750-ft gated spillway, under present plans.



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Too Many Tracks

Streamlined rail plan for Columbus would cut costs

A streamlined rail plan for Columbus, Ohio, has been proposed as a means of saving carriers millions of dollars annually in operational, maintenance and grade elimination costs.

The program—worked out by Columbus engineers—suggests simplification of the rail system. It calls for such changes as more universal use of the same local rights-of-way by two or more lines, relocation of Union Station, and an outerbelt of rails so through trains can bypass the city.

The most controversial—and costly—proposal envisions removal of all train service except industrial switching from the Norfolk & Western south of the city. These trains would be detoured to the Chesapeake & Ohio right-of-way by a new line. Similar traffic would be taken from existing Pennsylvania and New York Central lines in or near Delaware and detoured to the C&O. A common freight classification yard could be established south of Columbus. And Union Station—owned by the Pennsylvania Railroad—could be shifted to a site on the C&O.

Still another suggestion involves completion of a belt line. This would follow the C&O to Goodale Blvd., jump the Scioto River to the B&O, swing southeast to connect with the NYC line south of Columbus, cut north on the Pennsylvania and then complete the circuit by a right-of-way from near Delaware to the C&O. The venture would require joint participation in new construction in addition to the establishment of a belt line company.

Another recommendation requires little planning, less expense and could be put in operation within 60 days. This plan calls for the Dayton link of the Pennsylvania Railroad to use New York Central tracks from the west edge of the city to merging rail lines at Spruce and Dennison St. In return, the New York Central Railroad would run its trains over Pennsylvania tracks from Worthington to the State Fair Grounds.

Third scheme—besides slashing maintenance costs, reducing hazards and eliminating costly grade separation projects—has another advantage. It also would require cleaning up valuable real estate and make additional sites available for a new Union Station, post office and other civic center buildings.

Sanitary District to Start $7.8-Million Sewer Program

The sanitary district including Springfield, Ill., will soon embark on a $7.8-million sewer rehabilitation program as a result of recent voter approval of a $3.2-million bond issue.

The issue will stretch over 16 years and will be paid for through service charges levied in proportion to the amount of water used.

High-Lift Lock May Have Summer Start

This is how an artist sees the 100-ft single-lift lock being designed for TVA's, Wilson Dam at Muscle Shoals, Ala. And now if Congress will see fit to appropriate some $7.5 million that is budgeted construction could start shortly after July 1, start of the new fiscal year. The world's highest single-lift lock will cut by 75% the time taken by the average tow passing through the existing three locks. The new high-level fixed-span bridge pictured is part of the $35 million plan. If construction does begin this summer, it is expected traffic will use the new lock by late 1959.

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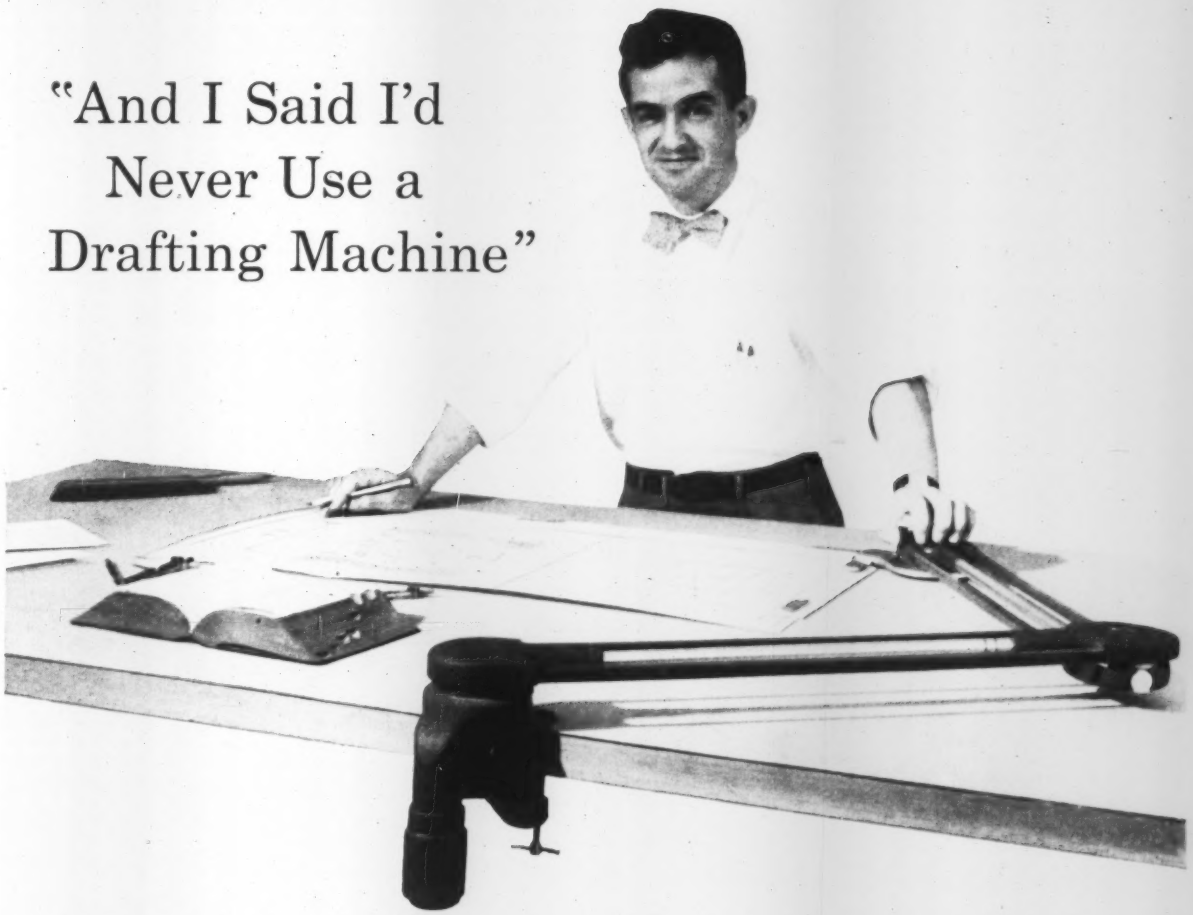

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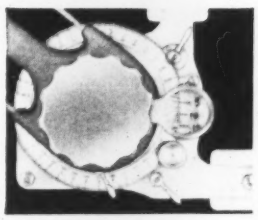

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Port a Good Risk

Engineer's survey endorses Indiana port's feasibility

Economic and operational feasibility of an $18-million Port of Indiana project on Lake Michigan, eight miles east of Gary, has been assured by a $40,000 engineering survey.

The 2,000-acre site plan calls for construction of a large L-shaped breakwater rising 12 ft above average low water, dredging of the outer harbor and additional dredging to provide a 30-ft deep channel and harbor with 1,000-ft clearance within the breakwater-protected area. $9.1 million of the proposed cost would be needed to provide terminal structures, warehouses and dockage.

Tippetts, Abbett, McCarthy and Stratton, New York City engineers were retained by a combine of private interests.

Bonds for construction of the terminal facilities would be retired through dockage and warehouse charges, and financing of dredging and harbor construction would be backed by private interests. According to the engineering firm, anticipation of completion of the St. Lawrence Seaway in 1960—the approximate time of completion of the proposed port project—had no bearing on the results of the survey. Financial feasibility was investigated on the basis of natural growth in the area and the demand for additional port facilities at present.

Three railroads, the New York Central, the Indiana Harbor Belt Railway and the Chicago South Shore and South Bend Railroad, all serve the site.

Provision has been recommended for possible trailer-ferry facilities in the port. Tractors, leaving their trailers at the port would be free to haul others in the Gary area, and the trailers ferried to other lake ports at the lower water-freight rates would be picked up at destination ports by other tractors, which would complete their trips.

Plans call for the harbor to be linked with U. S. 20 by an access road and also with the east-west northern Indiana tollroad.

The engineers stated that final phases of the survey would undoubtedly substantiate conclusions presented in the report. Disadvantages of the Chicago-Calumet River water terminals and physical problems encountered in expanding facilities there have given emphasis to the report since channels are congested and numerous bridges add to the cost and slowness of handling cargoes, according to the report.

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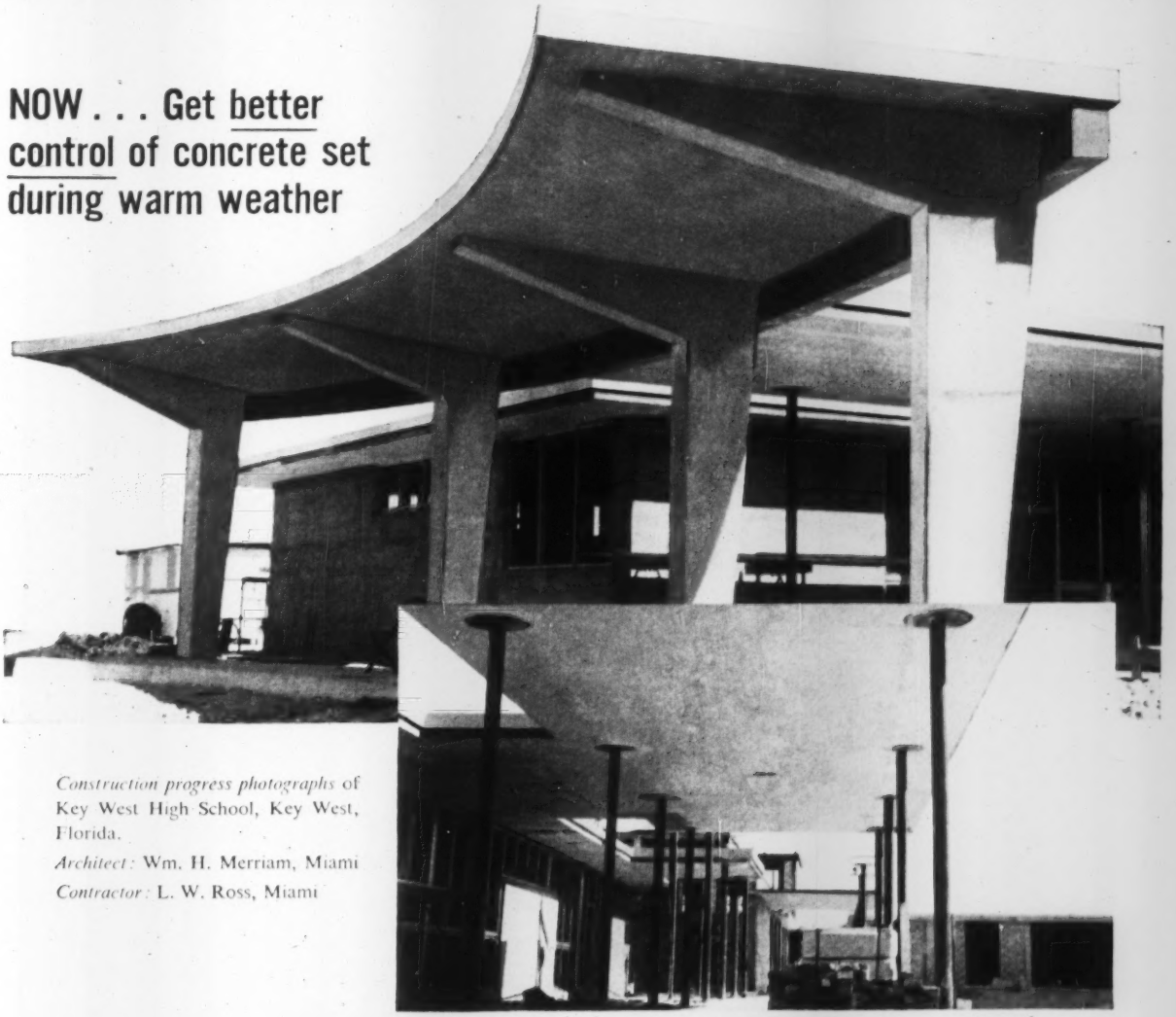

Construction progress photographs of Key West High School, Key West, Florida.

Architect: Wm. H. Merriam, Miami

Contractor: L. W. Ross, Miami

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FLOODS have made headlines in many areas of the U.S. in the past several months. Record damage has been wrought in New England and in northern California. In previous years it has been other areas. In future years it may be still others—or floods may return to scenes of former destruction. One such is Los Angeles—perhaps the largest metropolitan complex in the U.S. that could be subject to major flood devastation. The last truly big flood in Los Angeles, in 1938, took 49 lives and did $42 million worth of damage. Since then much construction for flood protection of Los Angeles has been accomplished. But chances are that should a 1938-size flood occur today the death toll would be substantial and the dollar toll would probably exceed the 1938 flood. Reason is that a comprehensive flood control plan is only 41% complete, and growth of the city since 1938 has been prodigious.

Is Los Angeles Ready for a Flood?

L. L. Wise
Associate Editor

Average rainfall in the Los Angeles area is only about 15 in. a year. But there is almost never a normal year. It seems as if the rainfall is either very slight—less than 10 in.—or that it is very great, with half of the normal annual rainfall coming in a 30-hr period. It's in these latter situations that flood conditions develop.

The Los Angeles flood plain, gradually rising from sea level, is exposed to the Pacific Ocean. About 30 miles from the ocean, the San Gabriel Mountains rise abruptly from the plain. First rise reaches elevations of 6,000 ft, and some 10 miles farther back higher mountains reach to 10,000-ft elevations.

Moist tropical air masses moving in from the ocean are lifted by these mountains, resulting in intense precipitations. It was this type of mountain storm that caused the great damage in the 1938 flood. Huge masses of water rushed down the mountains carrying away virtually everything in their paths. Although some mountain flood control structures had been constructed they were inadequate to cope with the runoff. For example, at Big Tujunga Dam—the only completed unit of a planned series in Tujunga Canyon—maximum 24-hour runoff was four times the reservoir capacity.

But mountain storms are not the only source of damage. Occasionally rainfall will be intense on the flood plain area, with the storm drain system simply unable to cope with it. This happened in January this year when a record 8 in. fell in 36 hours at the Los Angeles Airport.

The 1934 flood which took 41 lives in a limited area is also classed as being caused by a valley storm. This was a case of a 3- or 4-day storm finishing off with 15 in. in a 24-hour period. Intense runoff followed by debris flows in the La Crescenta-La Canada area took the toll of lives. But none of the mountain reservoirs filled to the point where it was necessary to open their gates until after the storm peak had been absorbed.

Complicating the whole situation is the almost complete lack of storm predictability. Weather moves in from the Pacific Ocean where reporting centers are few and far between, so it is hard to know what is coming. Flood control officials are studying storm patterns in an effort to give as much warning as possible.

The 1938 and 1934 floods were, by far, the most damaging in southern California history. (Up to recent months the American Red Cross listed the 1938 flood as the fifth most disasterous in U.S. history. It's now probably seventh, with the New England and northern California floods taking precedence.) But most authorities consider the 1862 flood to be the biggest that ever hit the area. However, at that time the sleepy pueblo of Los Angeles had less than 5,000 inhabitants.

The worst storm, according to modern records, occurred in 1943. But it resulted in almost no damage because the ground was dry. Even though rainfall at some mountain locations averaged an inch an hour for 24 hours, runoff was nominal because the first 10 hours of rainfall were soaked into the ground. Rainfall preceding the 1943 storm had been only 28% of normal. The 1938 storm, which was almost as big, came at the end of the season that had resulted in 107% normal rainfall. In planning flood control work, the Corps of Engineers use the 1943 storm for design purposes and assume that it occurs on 1938 ground conditions.

• **Debris**—Complicating the flood situation in Los Angeles County are debris flows that can be even more

devastating than water runoff. For example, most of the devastation of the 1934 flood was caused by debris flow. This storm centered on an area that had been burned off by a forest fire. Result was an average production of debris of 87,000 cu yd per sq mi.

Debris in the L.A. area refers to sand, gravel and even boulders (one huge rock moved by the 1934 storm weighed 60 tons). It originates from stream beds and side slopes of precipitous mountain canyons. Heavy rainfall lubricates the rock and sand formations causing movements somewhat like the flow of lava from a volcano, except that debris flows are much more rapid.

Debris flows have a decided impact on engineering design. Major flood control reservoirs in the Los Angeles area are designed to be effective for flood control purposes even after a 50-year accumulation of debris. In the 1938 flood San Gabriel Dam lost 10,000 cu yd of storage capacity due to debris flows from a 1.63-sq mi drainage area.

Engineers have also devised special debris dams and debris basins to reduce damage from such flows. These are generally located in the mouths of hillside canyons. They are composed of an earth embankment with a concrete weir, which slows runoff velocity, causing the debris to settle out but permitting water to pass on.

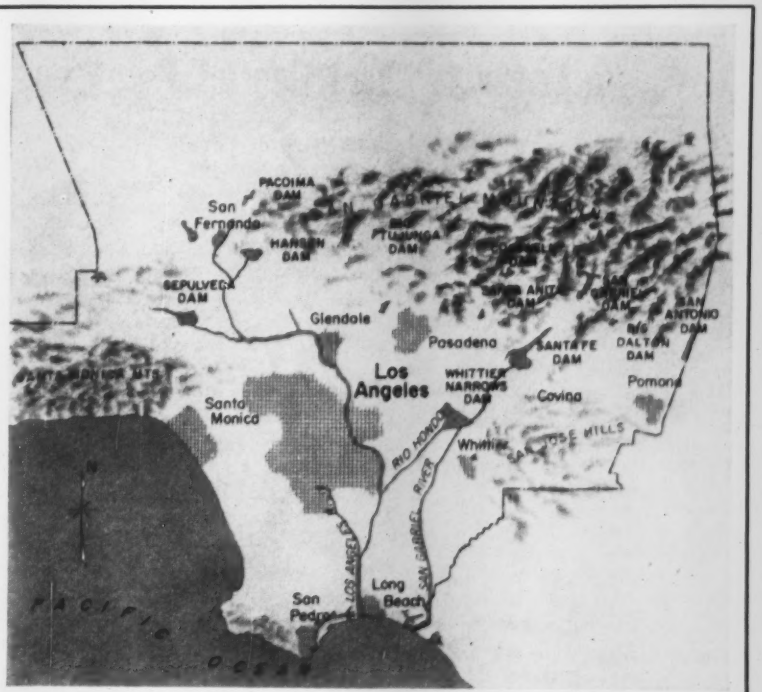
Debris dams and basins are particularly important in areas damaged by fire. In November, 1954, a brush fire burned off several thousand acres in La Tuna Canyon. Realizing the risk developed, the Los Angeles County Flood Control District, at a cost of $100,000, had built by emergency force account contract a temporary debris basin. This pit and earth dike structure was completed last January just as a heavy valley storm hit the area. And the basin retained debris that may have caused considerable damage had it not been stopped.

Improvement of La Tuna Canyon is part of the federal program. And at

In the San Gabriel Mountains, reservoirs built mostly by the Los Angeles Flood Control District form a first line of defense.

Between the mountains and the ocean, the Corps of Engineers has improved and paved river channels, built control works.

With all that has gone up, the entire program to protect Los Angeles from flood damage is not yet half done.



FLOOD CONTROL RESERVOIRS are prime part of damage preventive system. Sepulveda Dam is a long earth dike with gate and spillway structure straddling the Los Angeles River.

a later date the Corps of Engineers is expected to construct a permanent debris dam together with channel improvements.

After the debris basins fill, they must be cleared to provide room for material from subsequent storms. This is becoming an increasingly difficult problem because available areas for free disposal of the material are becoming scarce. This means that property must be acquired for debris disposal. Studies aimed at combating the debris disposal problem include consideration of sale of the material for use as aggregate in construction work. None of the large flood control dams has filled to the point where debris removal is a pressing problem. But this may change before too long.

• **Flood control dams**—Key facilities in the Los Angeles flood control system are a number of major dams. Reser-

Major Flood Control Dams for Los Angeles

Dam	Stream	Agency	Type	*Height (ft)	Volume (1000 cu yd)	Crest Length (ft)	Original Reservoir Capacity (acre ft)	Year Completed
Big Santa Anita	Big Santa Anita Creek	LACFCD	Concrete arch	225	76	612	1,376	1927
Pacoima	Pacoima Creek	LACFCD	Concrete arch	365	226	640	6,060	1929
Big Dalton	Big Dalton Creek	LACFCD	Concrete multiple arch	146	45	480	1,053	1929
Big Tujunga	Big Tujunga Creek	LACFCD	Concrete arch earthfill wing	200	79**	800	6,240	1931
Cogswell	West Fork, San Gabriel River	LACFCD	Rockfill, concrete slab facing	265	1,045	585	12,298	1934
San Gabriel	San Gabriel River	LACFCD	Rock and earthfill	310	10,600	1,500	53,344	1939
Hansen	Little Tujunga Creek	CE	Earthfill	97	13,990	10,475	34,100	1940
Sepulveda	Los Angeles River	CE	Earthfill	57	2,540	15,440	17,440	1940
Santa Fe	San Gabriel River	CE	Earthfill	99	12,906	23,800	34,300	1948
Whittier Narrows	San Gabriel River & Rio Hondo	CE	Earthfill	55	3,200	16,960	35,000	1956
San Antonio	San Antonio Creek	CE	Earthfill	160	6,050	3,850	9,110	1956

*Above streambed
**Concrete only

Trench hoe solves difficult problem at Oahe Dam

Shale loading speeded up with use of trench hoe

Ingenuity always pays off — as it is for Pierre Constructors, excavating the stilling basin at Oahe Dam, Pierre, South Dakota. Approximately 114 thousand yards of tough shale must be excavated for construction of the huge basin.

Early phases of this excavation were handled with a shovel but Pierre Constructors realized that precise side wall cuts and accurate grade levels were not feasible by this method. H. B. Bruce, Project Manager for Pierre Constructors, pioneered the thought that a Manitowoc 1¼ Yd. trench hoe could do the job. The hoe has been operated from above and to the sides of the cuts and has not been confined to operation into the face of the excavation as a shovel would be. The results speak for themselves. More yardage has been removed and more important, accurate grades and precise faces have been maintained throughout the project.

Boom stiffness, unusual stability, and power to spare allow this hoe to work from any position and excavate shale without the need of blasting. The versatile Manitowoc uses a maximum of four passes in two minutes time, loading 6 Yd. trucks. Smooth torque converter drive plus air controls enable the operator to handle anything the bucket encounters with ease.

HOE HAS MANY OUTSTANDING FEATURES

This sturdy Manitowoc Hoe can dig down to 25'6", reach out 38' and can dump into the trucks with ease at any loading level. Extremely mobile, the 1¼ yd. Model 2000 can be moved as easily as a small machine. The counterweight is self-removing, enabling the hoe to be trailer moved across country — from job to job — and of course can be easily converted to shovel, crane or dragline as the operation requires. Full information on this unit, as well as sizes ranging up to 5½ yd., may be obtained from the MANITOWOC ENGINEERING CORP., MANITOWOC, WIS.

. . . Is Los Angeles ready for a flood?

LOS ANGELES RIVER in San Fernando Valley district looks like no other river in the U. S. Normally dry except for trickle down the center, channel is paved to facilitate swift movement of flood waters through built-up areas.

vours formed are primarily for temporary storage rather than for long term water conservation holdings. (Hansen Dam, for example, is designed for inflows of 60,000 to 100,000 cfs with outflow of 22,000 cfs.) In other words, purpose of the reservours is to knock the peak from storm flows. Water is released as rapidly as possible from the reservoirs to the full extent of the channels to provide room for additional runoff from the same or subsequent storms.

Not all the water is wasted, however. The Los Angeles County Flood Control District operates a series of spreading basins. Water is diverted from flood channels to the spreading basins which serve to let the water soak into the ground and build up the groundwater table. In some channels where area is available, the bottom is widened and paved with riprap. This has the effect of making the channel a spreading basin. Thus, as much of the storm flow as possible is saved for use—an important factor in what is normally a water starved area.

• **Channel flow**—The huge amounts of swift moving water released to the channels have resulted in unusual hydraulic channel design problems. Grades involved in the channels reach as much as 15%. And velocity is as high as 60 fps. Most notable instance is the Verdugo Wash flood control channel that extends from Montrose through Glendale. This channel is designed to take 40,000 cfs at velocities up to 60 fps. Flow of the biggest flood channel—the Los Angeles River through the heart of the downtown area—reaches 30 fps.

Detailed model studies have resulted in super-elevated channels with curves laid out on spirals to prevent wave action. Most important consideration in channel design is to make gradual grade changes and gradual size changes.

In general, the paved flood control channels are rectangular, for this gives better control of higher velocity. And, it is more economical in earthwork quantities. Where velocities are lower and where economics dictate, channel sections are trapezoidal. Most channels are fully paved. Others have paving only on the side slopes. And some side slopes are lined with riprap rather than concrete.

• **Flood protection organizations**—As can be gathered from the foregoing, there are two major agencies—one local and one federal—building and operating flood control works in the Los Angeles area. The Los Angeles County Flood Control District—the local agency—has probably contributed more to preventing flood damage than any other local agency in the U.S. Federal work through the Corps of Engineers has been substantial, too. And the cooperation between the two agencies is noteworthy.

First on the scene was the LACFCD. A 1914 flood prompted the 1915 state legislature to form the district which includes almost all of Los Angeles County. First significant work started in 1917 with a $4.5 million bond issue that permitted construction of Devils Gate and San Dimas dams. A subsequent $35.3 million bond issue in 1924 permitted construction of several facilities including two San Gabriel River dams. Both these structures are ranked among the highest earth- and rock-fill dams built—San Gabriel Dam is 310 ft and Cogswell Dam, 265 ft. Other major LACFCD structures are Pacoima Dam (a 372-ft concrete arch), Big Tujunga (a 200-ft high concrete structure with an earthfill wing), Big Santa Anita Dam (a 225-ft concrete arch) and Big Dalton Dam (a 146-ft concrete multiple arch). (Heights are above streambed level.)

The Los Angeles County Flood Control District now operates on a $12-$14 million a year annual budget. Of this, $8 million comes from ad valorem taxes, the remainder from state funds or is reimbursement from other sources.

First claim on these funds is maintenance and operation of the system. The District maintains all flood control channels including most of those constructed by the Corps of Engineers. It operates all dams except for

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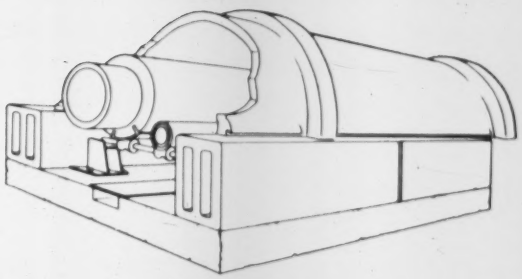

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A Stillwater Conduit System can be designed to handle any combination of service pipe the job requires. Experienced Stillwater engineers are ready to give you complete start-to-finish assistance in planning, estimating, and supervising construction of an efficient, trouble-free system.

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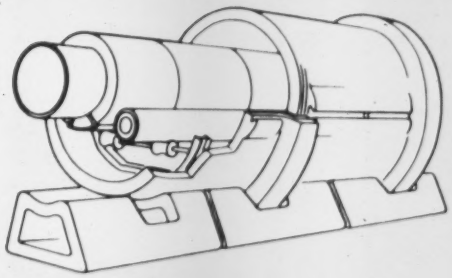

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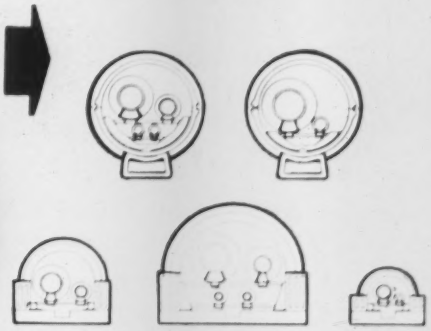
. . . supplied complete with combination underdrain and support structure. Available in 12 sizes, each with the proper underdrain support.

Diagrams show just a few of the hundreds of service piping combinations that can be protected with Stillwater Conduit Systems.



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. . . Two agencies tackle the flood problem

DEBRIS DAMS are unique structures in the Los Angeles area flood system. Concrete weirs in canyons are aimed at stopping sand and rock while permitting water to pass.

the major structures built by the Corps of Engineers.

Second claim on the annual District monies is for participation on federal projects. The county provides rights-of-way for most federal channels. And it builds all highway bridges across flood control channels.

Final call on the District's money is for extensions to the basic flood control system. Where major projects are involved, funds may have to be accumulated over a period of years. Thus a $3-million channel project might come along only once in several years.

The maximum tax rate supporting the Los Angeles County Flood Control District operations was originally established by legislation at 10¢ per $100 of assessed valuation (excluding bond service). This eventually proved to be inadequate, and in 1944, was upped to 15¢ per $100.

Early flood planning in the L.A. area was spasmodic and unintegrated. So in the late 1920's, the District set out to prepare a comprehensive plan. First version of this plan was completed in 1931. And a bond issue was placed before the people in 1934, but was voted down because of depression conditions.

• Corps of Engineers steps in—First federal participation in flood works in the L.A. area came shortly after failure of the 1934 bond issue. At this time, $13 million of Emergency Relief Administration money was allotted. The Corps of Engineers was designated as the federal construction agency because it had a going organization established for harbor work and had had flood control experience on the Mississippi River.

In 1936, Congress passed the first omnibus flood control bill that gave the Corps of Engineers nation-wide flood control responsibilities. This act authorized expenditure of $70 million on the Los Angeles and San Gabriel River systems.

Next step was a reanalysis of flood control needs. The Corps of Engineers working with LACFCD developed an overall plan that is now guiding flood developments in the Los Angeles area. In preparing the plan, a 50-year damage projection was placed before Congress in 1940. This indicated that the $350 million of federal construction proposed would prevent $586 million of direct damage and an additional $350 million of indirect damage. It was on this basis that Congress authorized the extended program for federal construction.

In general, the Corps of Engineers reservoirs are located high on the flood plain but outside the mountain area (as contrasted with the LACFCD dams which are generally in the mountains). Typically, a dam will involve a fairly low but relatively long earth

Emergency pipe order gets quick Action from Armco Salesman

On August 8, a short-section rigid pipe storm drain tailed under a street in Kansas City, Missouri. The pavement collapsed and traffic was blocked. At 4:30 Maurice Ellis, a young Armco sales engineer serving this area, received an emergency phone order from the Park Department for 110 feet of 36-inch-diameter Armco Corrugated Metal Pipe. He then called the Armco plant in Topeka, ordering fabrication. At 8:00 A.M. on August 10—exactly 39½ hours later—an Armco truck was at the site with the pipe!

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Maurice Ellis is a *typical* Armco sales engineer—trained to give all-out service to engineer and contractor customers as part of his job.

At one site you may find him kneeling on the ground, showing a new crew how easily Armco MULTI-PLATE Pipe bolts together. Another place, he may be twisting a soil auger, helping an engineer plan the location for Armco HEL-COR Perforated Pipe. Muddy clothes and a stiff back are his occupational hazards.

Your own Armco salesman may be an ambitious young engineer. Or he may be a 25-year veteran. Both know the answers on Armco products.

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If you don't know him, write us for his name and address.

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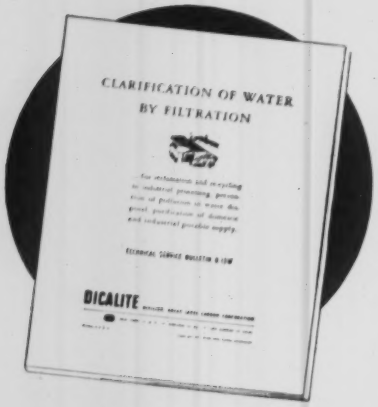

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. . . L.A.'s is a unique flood problem

Floods and flood control in the Los Angeles area are notable for these things:

TYPE Nowhere in the U. S. and in no other populated area of the world is there the likelihood of a flood type such as can occur in the Los Angeles area. Heavy, nearly-tropical precipitation on a gently-sloping metropolitan area ringed by high mountains results in almost instantaneous runoff that can cause tremendous devastation.

ORGANIZATION Nowhere in the U. S. is the federal-local government team flood control effort as well established as it is in the Los Angeles area. Federal and local agencies have spent more than one-third of a billion dollars in flood control construction. But they figure that another three-quarters of a billion dollars is still necessary.

GROWTH The tremendous industrial and residential growth of the Los Angeles flood plain makes the situation dynamic rather than static. Plans drawn 20 years ago while still effective for their purpose are not now totally adequate. New and more localized flood works projects need to be planned as the situation changes.

embankment protected by a spillway.

The Corps started on Hansen Dam even before the total program was authorized in 1940. Since then the Corps has completed Sepulveda Dam, Santa Fe Dam, Whittier Narrows Dam and San Antonio Dam (the latter two completed in 1956). Besides the major structures, the Corps has five debris dams. And the Corps has improved 46.7 miles of main channels and 33.8 miles of tributary channels. Still to be built in the Corps of Engineers program are 28 debris dams, 54.5 miles of main channels and 148.9 miles of tributary channels.

Total federal expenditures to date are about $180 million. And it will require another $200 million to complete the entire federal system. The major federal job left to be done is on the San Gabriel River system both above and below Whittier Narrows Dam. The Corps of Engineers could effectively use $25 million a year for the next five fiscal years on this system. Indications are that it will get somewhere between $15 and $20 million in the 1957 fiscal budget.

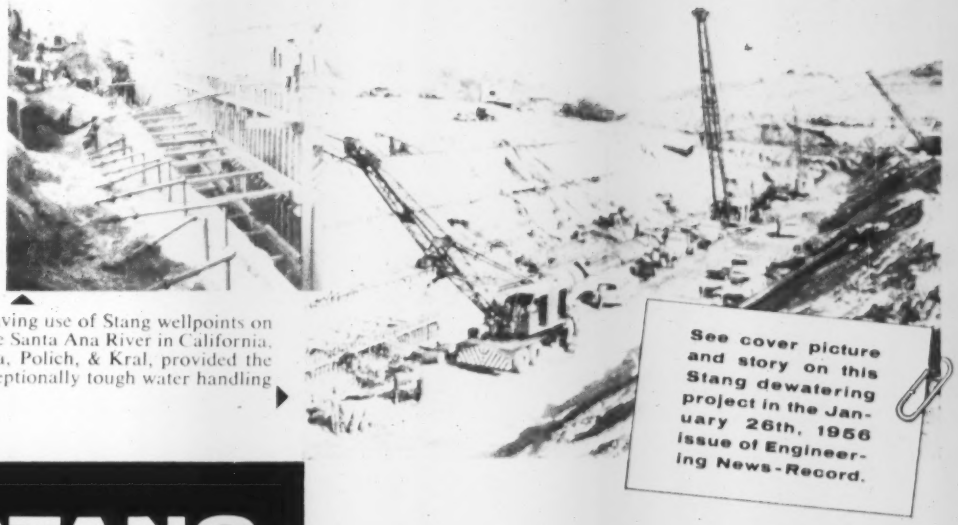
Cooperation between the federal and local agency has been remarkable —particularly when compared with the situation in other areas of the country. This cooperation is even more noteworthy in the time of flood disaster.

Because of the swiftness with which a flood descends on the Los Angeles area, there is actually not much flood combat work that can be done. Only in rare cases is there a levee battle such as might occur on the Mississippi, or as did occur in the December, 1955, northern California floods. (There was a fight on a Los Angeles River temporary levee during the January 1956 storm.)

Both agencies during a flood fight cooperate in operation of the dams, pumping plants and other conservation structures. And they work closely together on emergency channel repair as well as on efforts to alleviate damage to private property.

• **Growth presents problems** — The main control system is now only about 41% complete. There are enough reservoirs so that a flood of the 1938 type would do little damage in the San Fernando Valley and on the main channel system. The problem now has become one of getting local drainage into the main system. And, this is more a burden of the municipalities involved than it is of the Corps of Engineers of LACFCD. Flooding of residential areas, such as occurred as result of the January 1956 storm, is typical of this problem. Each new industrial or residential development adds to the impervious area, and results in increased runoff. For example, the San Fernando Valley is now nearing 40% impervious whereas 20 years ago it was less than 20%.

(Continued on page 50)



This time and money-saving use of Stang wellpoints on a pipeline crossing of the Santa Ana River in California, for contractor Ukropina, Polich, & Kral, provided the ideal solution to an exceptionally tough water handling problem.

See cover picture and story on this Stang dewatering project in the January 26th, 1956 issue of Engineering News-Record.

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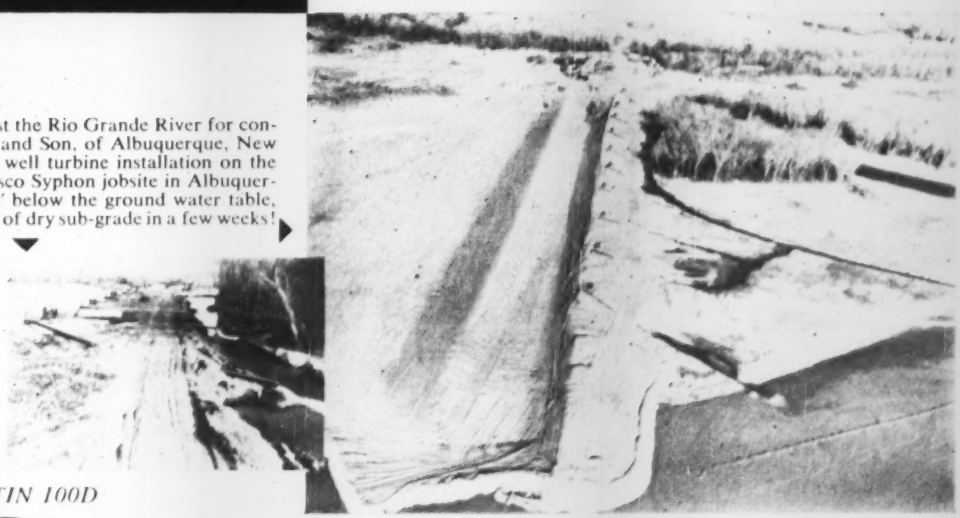

Stang won a race against the Rio Grande River for contractor D. D. Skousen and Son, of Albuquerque, New Mexico, with this deep well turbine installation on the Rio Grande at the Atrisco Syphon jobsite in Albuquerque. With sub-grade 38′ below the ground water table, 10 pumps provided 800′ of dry sub-grade in a few weeks!

WRITE FOR BULLETIN 100D

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562

. . . What damage from future floods?

As a step in relieving local drainage problems, a $179 million bond issue was passed some three years ago. This bond money is administered by the LACFCD. Plans are prepared by the various cities and the county engineer based on LACFCD standards. After checking the designs, the District administers construction. About a third of the money has now been committed. But even with full expenditure of these funds, the local drainage job is only partly done. Much more will be needed to prevent ponding in streets and residential areas during heavy rains.

Up until a few years ago, there was no legal way to prevent industrial or subdivision construction in areas subject to flood damage. This condition has been remedied to a certain extent. Now there is a legal mechanism whereby subdivisions proposed for areas subject to severe flooding can be denied permits.

Normally, each proposed subdivision is referred to the LACFCD for evaluation. Areas are rated as reasonably free of flood hazard, or subject to frequent, infrequent, remote or possible flood hazard. Permits are disallowed in Los Angeles County and in most cities for areas subject to frequent or infrequent flood hazard. But the pressures for growth in the L. A. area are such that areas subject to remote or possible flood hazard are generally allowed to be completed. If all the land not safe from a 50-year storm remained undeveloped, the Los Angeles area could house only about 1,000,000 people. Population is now 3,500,000. And ultimate population in the area is estimated as upwards of 5,000,000.

Some of the best aid in keeping new developments to areas reasonably free from floods has come from the financing agencies. The FHA, the Veterans Administration, banks and other lending agencies have become chary of the flood-prone areas. But this has only occurred in the last several years.

Another device which will permit construction in areas subject to infrequent flooding, is the establishment of local storm drain assessment districts. Where adequate drainage facilities are installed at the time the subdivision is built, the lending agencies will give aid.

• **What about the future?**—Some observers have credited the L. A. area with being extremely lucky during the last 15 years or so. With rapid growth and only partial completion of the main flood control system, a repeat of the 1938 flood could have been much more devastating than it was in 1938. But it appears now that major damage would be minimized in most areas. Lack of complete facilities to get runoff into the main control system would be the greatest damage source now. But, this is not the killer type of flooding.

Certain areas, where residential and industrial development has been faster than main flood control system development, are particularly subject to flooding. Worst area now is some 30 miles east of Los Angeles in the West Covina area. Unimproved channels in this district might lead to high damage. Result is that emphasis of Corps of Engineers construction has now swung to this area.

Experience in other regions of the U. S. during recent months has shown that flood records are susceptible to being exceeded. The likelihood of a super flood occurring is slim—but still possible. With the works constructed in the last 18 years, it is doubtful that the Los Angeles area will ever be subject to complete rail and highway isolation for 10 days as it was in 1938. But such an occurrence is not impossible. Completion of the planned works would certainly do much to minimize—and perhaps prevent—extensive damage.

People Who Do the Work

H. E. HEDGER of Los Angeles County Flood Control District staff.

COL. A. H. FRYE, JR., of Los Angeles District, Corps of Engineers.

Dams, debris basins and channels in the Los Angeles area don't build and operate themselves. More than 1,500 people are involved. The Los Angeles County Flood Control District has 1,165 employees. Of these, 542 are in engineering classifications—including 33 right-of-way people, 168 engaged in administrative and clerical work, and 465 who are operators and maintenance men. The Corps of Engineers, on the other hand, has 387 people engaged primarily in flood control work (the Corps also has harbor and military construction functions). This includes 281 engineers, 51 maintenance and operating personnel and 55 clerical people.

Directing the work of LACFCD is Harold E. Hedger who has been chief engineer since 1938. A native of California and a graduate of the University of California, Hedger saw active service in both world wars. In the first, he was a navy enlisted man. And when he graduated from college in 1924 he received a commission in the Corps of Engineers reserve. Called to active duty in 1942 as a captain, he rose to the rank of colonel. During the last year of his military service, he was in charge of all Army construction in continental U. S. Except for military service, Hedger's entire career has been spent with LACFCD.

Other key District personnel are M. E. Salsbury, senior assistant chief engineer, and Paul Baumann, assistant chief engineer. Salsbury directed work of the district while Hedger was in military service.

Col. Arthur H. Frye, Jr., has been district engineer of the Los Angeles District, Corps of Engineers, since July, 1953. He follows many distinguished Army engineers in that capacity. A 1935 West Point graduate, Frye received a masters degree in hydraulics from the University of Iowa. In World War II he had important assignments in Africa and Europe. And among his post-war assignments was duty with the Manhattan Engineer District and the Atomic Energy Commission, including participation in the 1950 Eniwetok tests.

Many long-time civilian engineers support the work of the Corps of Engineers in Los Angeles. Included among the top people are William J. Lean, chief of the construction division, Harry W. Thompson, chief of the engineering division, and Edward Koehm, chief of the design branch.

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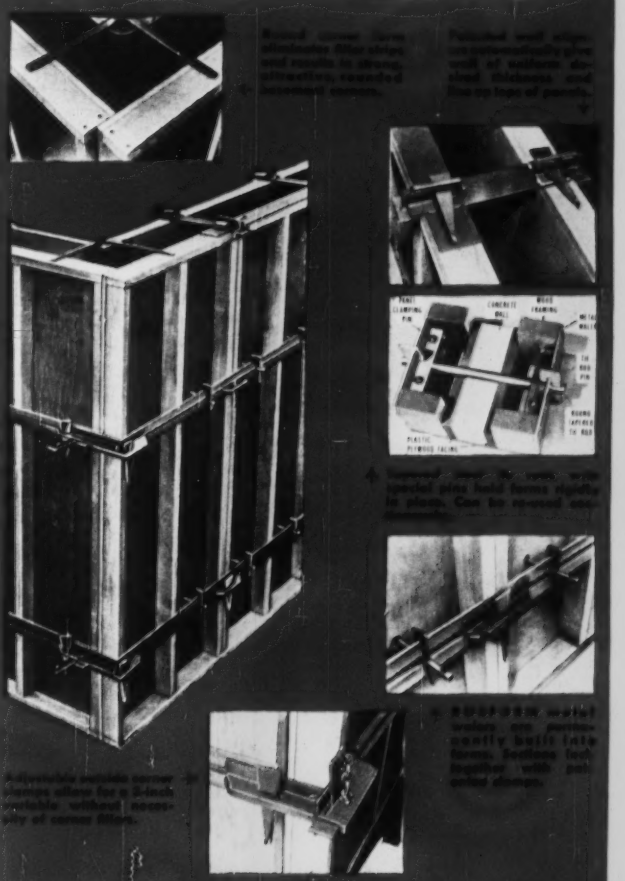

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EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Maneuverability is exceptional in spite of the size and capacity of the S-18. The full hydraulic power steering and good hitch design permit non-stop turns in only 36'. Here an S-18 makes a quick turn after spreading its load on a highway relocation job in Wisconsin.

The tremendous power of the S-18 with independent control of all scraper operations and the low, wide bowl provided fast loading in the loose sand of this Wisconsin airport job. Euclid's four section cutting blade, with each section adjustable, reversible and identical, cuts maintenance cost and assures the most efficient loading in any material.

High apron lift and independent control of all scraper operations facilitates dumping big loads. On this air base grading work in Kansas, the fast dumping, traction and speed of the S-18 enabled the contractor to maintain high production at low cost. Short overhang of the engine gives better stability in rough going.

Better Accessibility means More Work-ability

HAS THE VERSATILITY NEEDED FOR ALL KINDS OF JOBS

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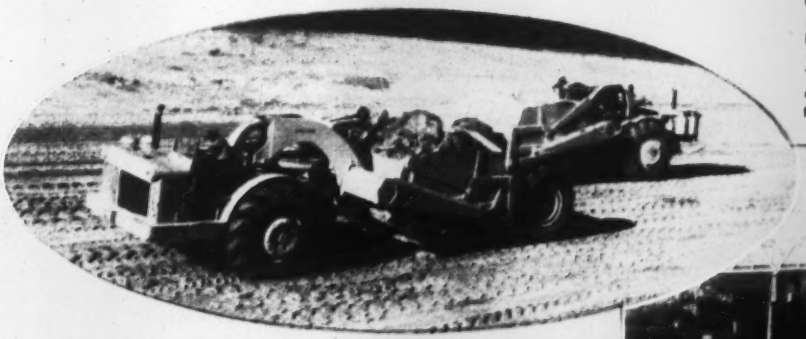
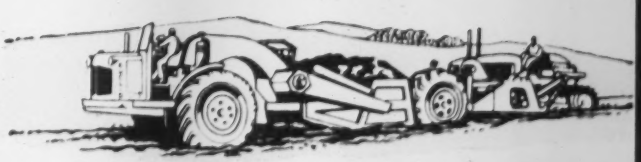
300 h.p. engine . . . Torqmatic Drive . . . 27.00 x 33 tires with 33.5 x 33 optional . . . 18 yds. struck capacity . . . 21 yds. heaped at 3:1 slope and 25 yds. at 1:1 . . . NoSpin differential . . . full hydraulic steering . . . non-stop 180° turns in only 36 feet . . . hydraulically controlled lever action of bowl, apron and ejector . . . four section reversible cutting blade . . . built to work with the biggest pusher tractors on the toughest jobs.

Grading this plant site on the Tennessee River proved the outstanding performance of the S-18 in difficult material. Heaped loads of heavy clay were picked up, hauled and spread in a hurry. The 300 h.p. engine, big tires, Torqmatic Drive and NoSpin differential pay off in better traction, flotation and work-ability.



Coming and going the S-18 cuts cycle time. The Torqmatic Drive and 300 h.p. engine permit shifting under full engine power—provide power and speed to move big loads fast. On this North Carolina highway job top extensions were used to increase bowl capacity—loads of 25 yds. and more were moved from borrow pit to fill at high speed.

COMPARE *the cost-cutting features of "Euc" Scrapers with your present equipment. Your Euclid dealer will be glad to supply information on the complete line—from 7 to 18 yd. struck capacities.*



Euclid Equipment

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General Motors Technical Center—

Designed to Meet Tomorrow's Challenge

The 25 buildings comprising General Motors Technical Center at Warren, Mich., near Detroit, went together with the precision of GM automobiles. GM wanted—and got—the best possible facilities for industrial research, which it proudly dedicated this week.

". . . If we are to meet tomorrow's challenge," said Charles F. Kettering, GM research consultant, "we must be equipped with tomorrow's facilities."

So the architects did not hesitate to incorporate advanced concepts in the design of the structures. They pioneered with metal sandwich walls, developed new bricks, tried out high-velocity air conditioning and made extensive use of color. They sponsored new types of luminous ceilings, found new ways to build stairs, and employed space frames and space structures, where applicable. And they strove to provide the utmost flexibility of space, to insure that, despite the uncertainties of research, the buildings will function properly not only today but far into the future.

• **Like a college campus**—The 25 buildings in the research center, providing 2,250,000 sq ft of floor area, are located on a 320-acre site ringed with trees. Clustered about a 1,780x360-ft artificial lake, the structures provide facilities for five central staff organizations: research, engineering, process development, styling and service. (The service section operates and maintains facilities for the whole project.) The site contains 11 miles of road and 85 acres of parking lots.

The buildings are low—none over three stories high—to eliminate the need for elevators. Shapes are rectangular, except for one building—the Styling Auditorium—which is a 107-ft-dia, steel-plate dome covered with aluminum (ENR Mar. 22, p. 46). In addition, contrasting with the block-like forms, a 138-ft-high ellipsoidal tank stands on three legs in the lake.

Construction of the project started in 1945. In the eleven years since, many of the advanced concepts employed in the design have come into wider use, but some, with promising prospects for better quality construction, are still in the offing.

• **Sandwich walls**—Exterior walls of the GM Technical Center buildings were one of the first significant installations of thin, sandwich panels with no backup (ENR Nov. 1, 1951, p. 55). The panels, factory-fabricated, consist of porcelain-enameled steel facings and an insulating core of plastic-impregnated paper honeycomb filled with perlite. Total thickness is 2 in.

Gray colored, the panels are arranged in horizontal bands above and below continuous strips of double-glazed windows in each story. In some buildings, the wall units extend between columns (which are spaced 5 ft apart), thus eliminating mullions. In others, they are set in prefabricated

aluminum frames, like windows. The frames are story height and 10 ft long.

An innovation when first installed, this type of wall construction has since been employed for many other buildings, some much taller.

The technique used for sealing the glazing and the panel joints, however, has not been adopted more widely, though the results are satisfactory in the GM Technical Center. Because no calking material tried adhered properly to the slick surfaces, and leakage resulted, the architects and GM's Inland Manufacturing Division developed a neoprene gasket seal, based on the one used around automobile windshields. After a glass or metal panel was fitted into the gasket, which previously had been set in the frame, a neoprene filler was wedged into place to seal the joint. According to tests, the assembly will withstand winds up to 120 mph.

• **Bright brick** — End walls of the buildings are built of brightly colored brick, developed specifically for this project. To obtain the gloss and brilliance desired, the architects adopted a ceramic-glazed, sand-molded shale brick, which was produced in a large kiln financed by GM. Now, this type of brick is generally available and being used more widely.

• **High-velocity air**—At the time the project entered the design stage, high-velocity air distribution was somewhat of a novelty for air conditioning. Yet, high-velocity distribution permits shallower ducts, thus shorter distances between floors.

The technical center architects worked out the bugs and designed a system for this project in which hot air and cold air are distributed at high velocity through main ducts to mixing boxes for individual diffusers. Since then, many similar installations have been made.

• **Luminous ceilings**—Throughout the buildings, extensive use is made of luminous ceilings, for uniform, nonglare lighting. Some of the designs developed for this project have been produced later by lighting manufacturers as standard equipment.

A good example is the installation in the Engine Research Building, where fluorescent lamps are placed above swing-down translucent-plastic panels set in 5-ft square extruded-aluminum frames. With a maximum brightness of luminous panels of 200 ft-lamberts, between 70 and 100 ft-c are maintained at working level. Venetian blinds on the windows control outside brightness.

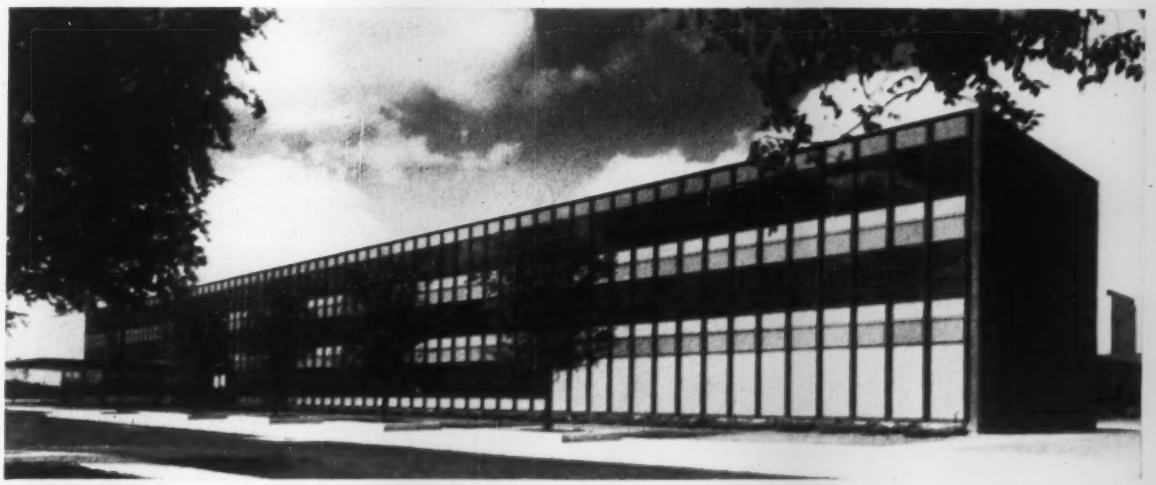
Noise control is achieved with wedge-shaped, perforated metal baffles suspended on 5-ft centers below the plastic panels, with cross baffles also spaced 5 ft c-c. Air diffusers and sprinklers are at baffle intersections.

In the Styling Studio Building, the designers took advantage of both natural and artificial illumination. They raised the ceiling at the windows to obtain more daylight, and converted the electric lighting into a sloping ceiling of light. An inconspicuous aluminum grid supports translucent plastic domes, which diffuse the light from fluorescent lamps above. Illumination at desk level is 95 ft-c. Again, sprinklers are located at grid intersections.

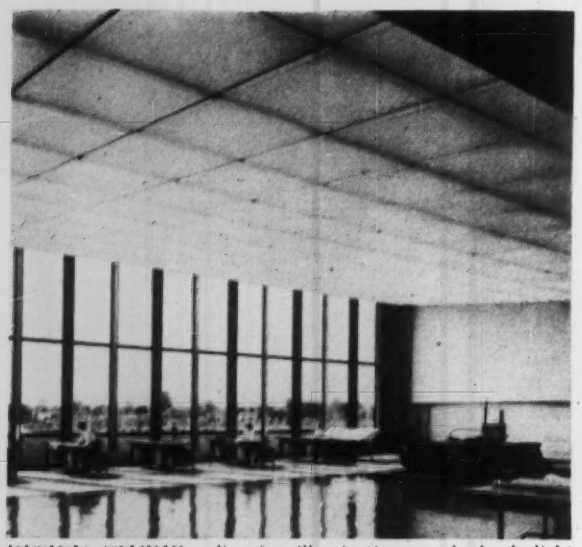
• **Hanging stairs**—Several novel stairway designs may be found in the buildings. Among the more spectacular are the three in the administration buildings of the research staff, the styling section and service section.

(*Continued on page 56*)

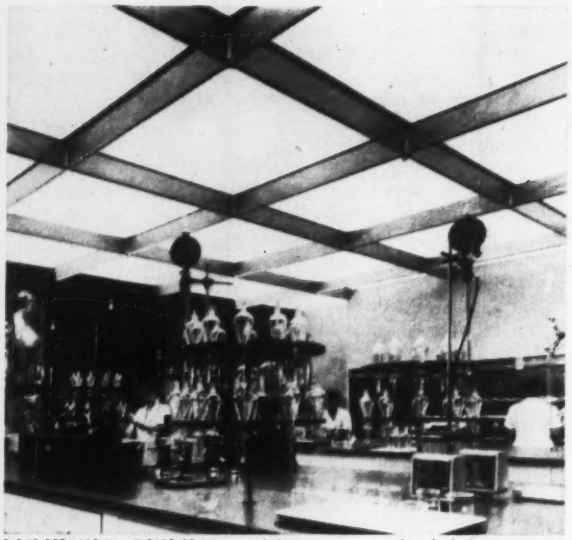
TYPICAL FACADE consists of continuous windows and gray porcelain-enameled sandwich panels.



LONG GLASS AND STEEL WALLS, punctuated at 5-ft intervals by black columns, terminate in end walls of colored brick.



DESIGN STUDIO relies for illumination on both daylight from large windows and immense luminous ceiling.



LUMINOUS CEILING in laboratories is divided by acoustic baffles into 5-ft modules, with fire sprinklers at intersections.

In the research-staff building, polished emerald-pearl granite steps, each weighing 1,500 lb, spiral upward from the lobby. They are suspended from pencil-thin stainless steel rods. Along the outer edge of the spiral, the steps are hung on vertical rods. At the inner edge, rods slope downward to an apex on the floor and upward to an apex above the second-floor ceiling.

In the lobby of the styling-section building, the stairway consists of broad, white terrazzo treads that overlap each other. These steps, too, are suspended on thin rods.

In contrast, the dramatic stairway in the service-section building consists of open risers of travertine supported by a single, central beam behind them.

• **Long-span framing**—No less imaginative is the structural steel framing adopted for the buildings. The designers, to maintain flexibility in use of space, called for long spans to keep the interiors free of columns. They employed various types of framing for these long spans to meet various needs—trusses, rigid frames and space frames—making use of welded connections and minimizing bracing wherever possible.

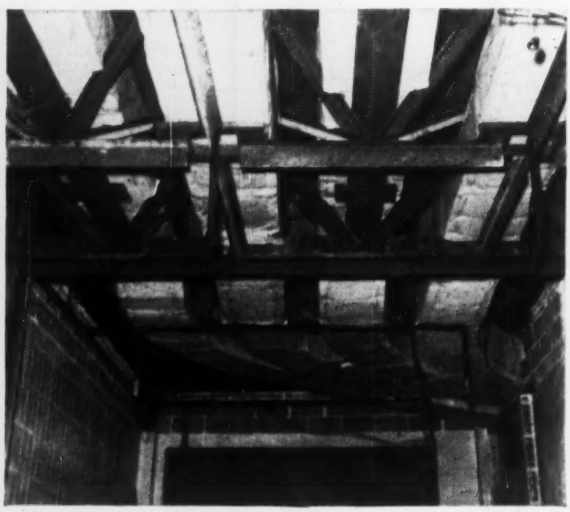
The most unusual framing adopted is that in the engineering-staff administration building—52-ft-span trusses of triangular cross section. Solid-web members could not have been used because of duct and pipe runs, and ordinary open-web joists would have deflected too much.

Turned with apex down, the triangular trusses are 29 in. deep and have a 5-ft horizontal base. The corner angles frame into hollow, rectangular columns spaced 5 ft c-c at the outer walls.

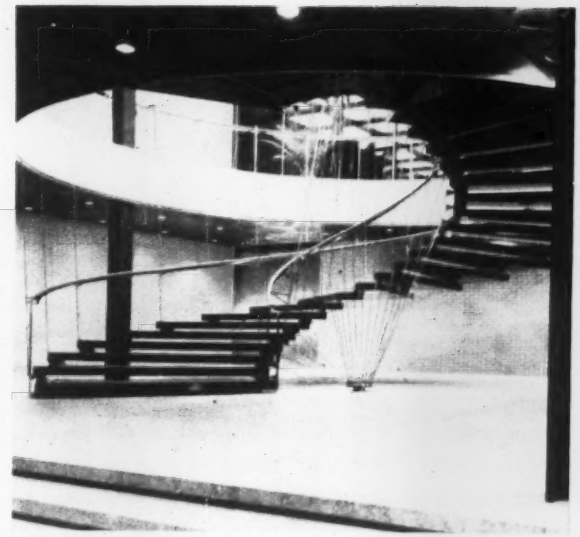
Even the ellipsoidal water tank required special developmental work. The designers wanted a stainless steel enclosure, but that was too expensive. Instead, ¼-in. stainless steel was bonded to ⅜-in. boiler plate (ENR Mar. 10, 1955, p. 33). The tank is 32½ ft high, has a horizontal diameter of 46 ft and holds 250,000 gal.

• **Flexible space**—In addition to employment of long spans, the designers adopted several ingenious measures to assure flexibility in use of space. The design is based on a 5-ft module. (Usually, buildings for which modular

SANDWICH PANEL is framed between hollow steel columns, which are spaced 5 ft apart.



OPEN-WEB FRAMING allows almost complete flexibility in locating ducts. These trusses are trianglar in cross section.



SPIRAL STAIRWAY is suspended on stainless steel rods. Each step, made of granite, weighs 1,500 lb.

HANGING STAIRS, silhouetted against black-glazed brick, consists of overlapping terrazzo slabs.

design is employed are based on a 4-ft module. But GM wanted 10- and 15-ft offices; so the 5-ft module is more convenient.) Each module is a complete unit with respect to structural framing, lighting, heating, ventilation, air conditioning, fire sprinklers, laboratory furniture, storage units, windows and doors.

Partitions generally can be placed along any module boundary. In one building, all partitions are movable.

In another—the Metallurgical Research Building—sections of the roof are movable. As experiments change, ventilating and other stacks can be inserted where necessary.

The roof consists of 4x2½-ft panels of Monel sheet, insulated with glass fiber. The panels are supported on steel angles that span between roof beams. For initial experiments, some of the panels have openings cut out for stacks and collars welded around the openings. When the stacks are removed, these panels can be replaced with solid panels and re-used elsewhere.

To give laboratory arrangements complete flexibility, the Research Staff Administration Building is built around utility columns spaced 10 ft apart along both sides of a central corridor. These shafts contain hot and cold water, gas, electricity, compressed air, distilled water, vacuum and in some cases, steam.

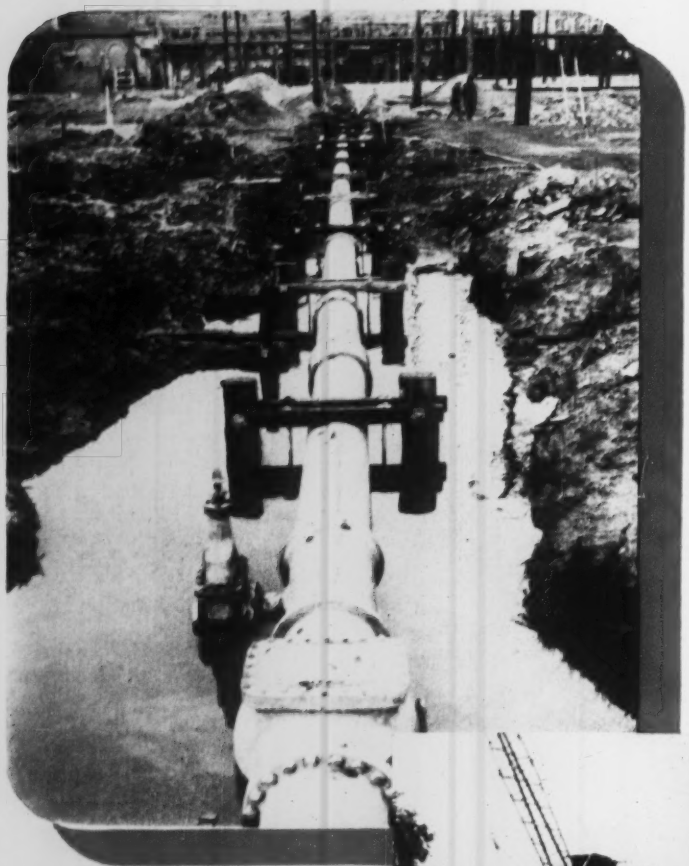
With utilities readily available, the space and function of any laboratory can be changed overnight. If desired, offices can be converted into laboratories, since the 5-ft modular design makes lighting and air conditioning also available in each unit. Switches, taps and valves are built into bench spaces keyed to the same module as the utility shafts.

• **Precision essential**—To meet the objectives of interchangeability, components had to be built to close tolerances. So despite the size of the project, every detail had to be designed and built to have the perfect finish and precision of a machine part.

Eero Saarinen & Associates, Bloomfield Hills, Mich., is the architect, in association with Smith, Hinchman & Grylls, Inc., Detroit, as architect-engineer. Bryant & Detwiler Co., Detroit, is the general contractor. Field supervision for GM was carried out by its Argonaut Realty Division.

WELDED RIGID FRAMES span 80 ft in the Service Section Garage and Shop Building. Designers used welding wherever possible in the 25 buildings comprising the project; other buildings, for example, are spanned by 80-ft welded trusses.

You can bank on it for jobs



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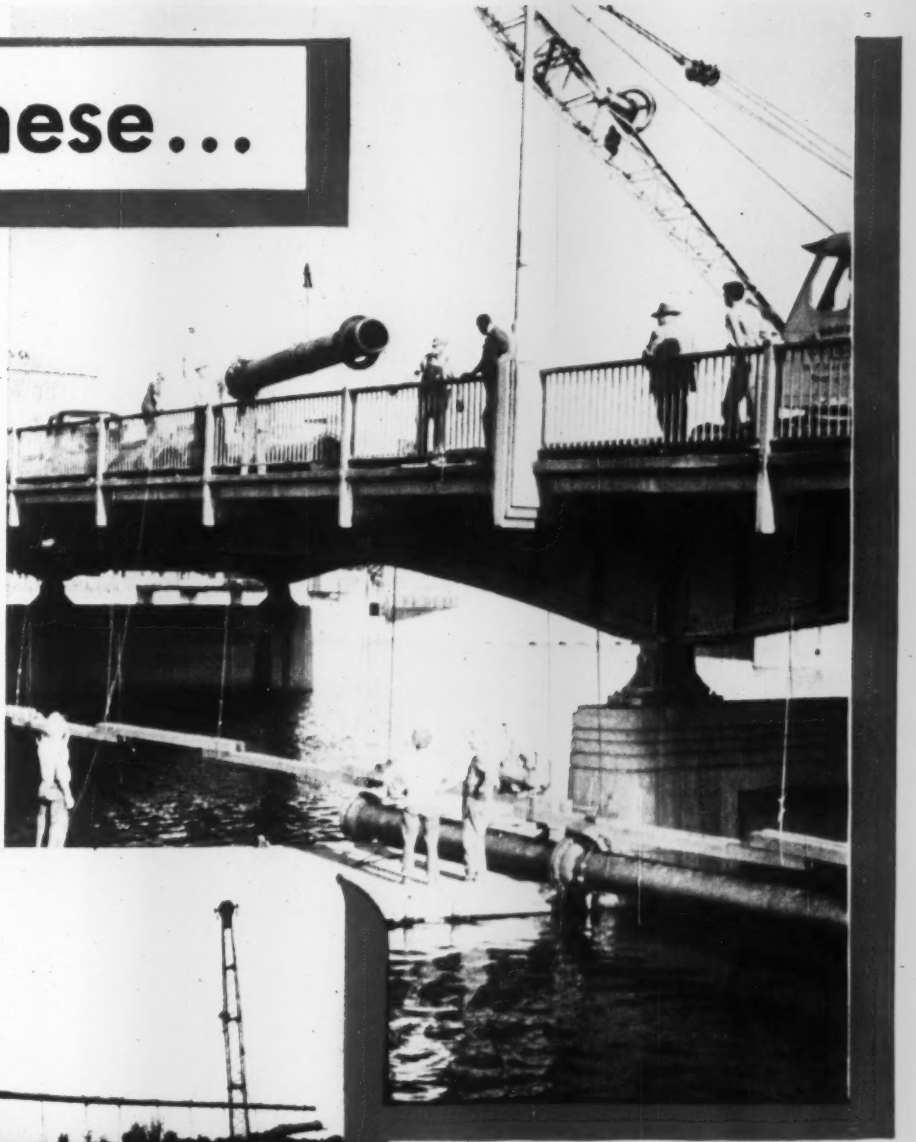


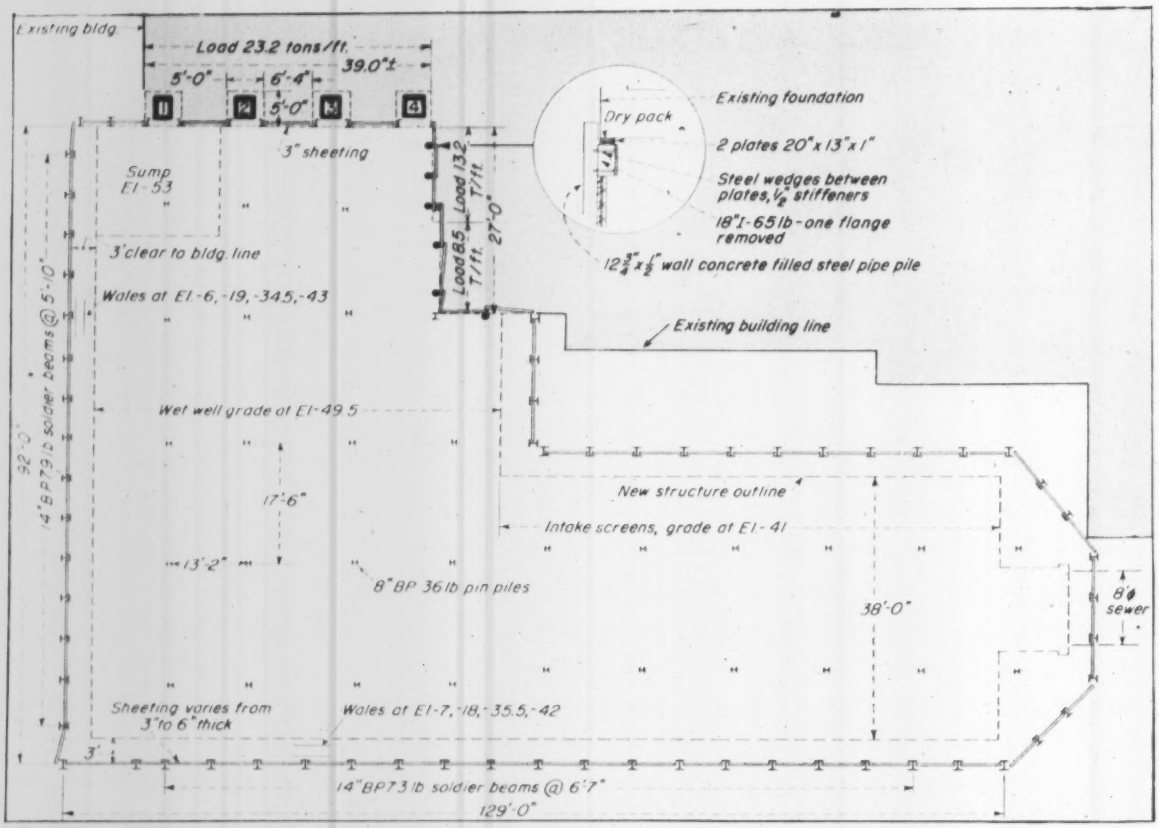
Flexible Joint cast iron pipe being laid across 600 feet-wide river at Waterloo, Iowa, for feeder line operating under 85 psi water pressure.

Installing 24-inch Flexible Joint cast iron pipe for river crossing at Fort Lauderdale, Florida.

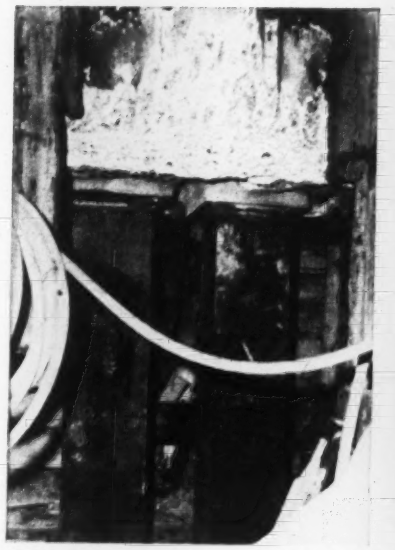
SERVES FOR CENTURIES...

TWISTED AND SKEWED SOLDIERS and pin piles resulted from encountering many large boulders in cofferdam for new wet well at New York City's Bowery Bay sewage plant extension. Yet in the same hole much running material was met.

How to Underpin and Dig Through



COFFERDAM excavation began at El 13. Fear of boulders determined use of pits to underpin one wall near sump.



FIRST PIT acted as sump for others after temporary underpinning was inserted.

STEEL CYLINDER piles were driven without losing any. Rock was pulverized.

62 Feet of Mud and Rock

"I never want to see another hole like this," is the way the job superintendent on New York City's $14-million Bowery Bay sewage plant extension describes tough underpinning and cofferdam work for a new low-level wet well.

The trouble is caused by near-impossible soil conditions in this area on the East River between the Triboro Bridge and LaGuardia Airport. The first 15 ft down from El 13 is earthfill and mud and silt. Then to El −49, bottom of the wet well, an uncommon glacial deposit consists of clay, sand, gravel and boulders, much running material and occasional layers of hardpan. This meant tedious and dangerous underpinning, mordinately difficult pile driving, and much hand excavation.

Bowery Bay plant is being enlarged from 40 to 120 mgd (ENR, May 12, 1955, p. 49). The new wet well is being dug directly adjacent to existing high level pumps and a well which bottoms at El-20. The wet well will receive raw sewage from a new 8-mi long intercepting sewer (ENR, Nov. 24, 1955, p. 34) whose invert is at highest possible elevation.

The general contractor, J. Rich Steers, Inc., moved onto the site in December 1954 and began the 62-ft deep cofferdam excavation in March 1955. Soldier beam driving immediately presented a problem. Large boulders caused 14-in. I-beam sections to twist as much as 180 deg. When pile hammers were removed, springing of the twisted members could be discerned. Many soldier beams skewed off at angles as great as 10 deg. In such cases, horizontal angles were welded between adjacent vertical members and perpendicular angles were attached so that sheeting could be placed. So difficult was the going that only four or five piles could be driven each day.

• Difficult pile driving—A good many soldiers could not be driven to grade. Using a 10B3 hammer, the constructors figured it was time to stop at more than 400 blows per foot. An 11B3 hammer caused pile damage.

Where soldiers don't reach grade, steel angles are inched down as excavation proceeds. When an angle reaches good hardpan, at grade, it is welded at the top to the soldier beam and braced horizontally at the bottom to adjacent soldiers.

Shovels began the excavation but they couldn't do very much in the mud and silt, so clam shells took over at El −2. Progress was slow because of the many boulders and occasional hardpan layers. Anything lighter than a 1½-yd clamshell would not take a bite in this material. Adjacent to the existing building is much running material requiring hand excavation.

Horizontal 3x6-in. and 3x12-in. wood sheeting is used for the cofferdam walls. Nominal 2-in. spaces between each board allow water to drain into the excavation, the spaces being filled with hay. Sometimes material runs so badly the sheeting has to be laid tight. When sufficient water runs out, spacer boards are inserted.

Cofferdam walls are 3 ft from the exterior building line, leaving room for up to 27-in. I-beam wales at Elevations −7, −18, −35 and −42. These are braced by 12x16-in. and 12x12-in. timbers vertically supported by 8-in. H-beam pin piles driven at intersections of horizontal timbers, about every 13x17½ ft.

Dewatering is accomplished by two 8-in. centrifugal sump pumps.

• Careful underpinning—The bottom slab of the main portion of the existing building, housing generators, blowers, controls and office spaces, is at El −2 and when excavation reached this level, Spencer, White & Prentis came on the job to do the underpinning.

Along this wall (indicated on the accompanying drawing), 12-in. steel cylinders were driven as close as possible to El −60 and to indicated bearing of 80 tons. Surprisingly, no piles were lost but the going was very slow. Boulders were rammed and pulverized and the debris was blown out with compressed air. Concrete was placed in the steel shells and steel brackets welded at the top under the building. Steel plates were inserted over the bracket, then wedged against a plate previously dry-packed under the building slab. Dry packing completed the operation. Subsequent settling can be compensated for by packing and driving wedges further.

When excavation reached El −20 in August, the really difficult underpinning of the existing wet well began. While loads at the other underpinned walls varied from 7.8 to 13.2 tons per lin ft, the wet well wall carried a load of 23.2 tons. Because the presence of boulders in the underlying strata was suspected, the contractor decided to underpin this wall with concrete piers.

Concrete piers, 5x5 ft, directly under the wall to be supported, were designed for 12 tons/sq ft bearing value. Excavation was dangerous and costly. Shorers dug out by hand and loaded a bucket much like the old wishing well type. Horizontal 3x8-in. sheeting was placed in the relatively firm material encountered at the start. When running material was met, 2-in. vertical sheeting was driven with airhammers and malls. Constant dewatering with diaphragm pumps was necessary. Pit

Pumping of concrete vs. . . . **. . . Batch truck delivery**

STRUNG OUT SITE meant frequent movement of delivery pipe. This was too slow and cumbersome so contractor switched to batch trucks, first building a wharf out to the floating concrete mixer.

walls were lined with tar paper to prevent water from pouring on the men below.

• **Pits act as sumps**—Specifications allowed only two pits to be dug at any one time. Digging began with pits No. 2 and No. 4. When down to grade, they were at first concreted up only 8 or 9 ft. Then two 14 WF 89 columns were wedged in under the building wall against a previously dry-packed plate. This was done so the completed pits could act as sumps to aid in dewatering pits No. 1 and 3. Spencer, White & Prentis started the pits in August 1955 and finished in November.

Excavation to grade (El −49, except for a small sump which will be at El −53) was completed in March.

Steers anticipates no trouble in keeping the excavation dry for placing concrete. French drains covered with tar paper will be placed throughout the site about 12 ft on center and 2 ft below grade. They will drain to the sump pit in the northeast corner. This method worked advantageously in the intake structure area adjacent to the wet well which is at El −39.

Concrete will go from buckets through chutes and elephant trunks into free-standing wood forms. Where possible horizontal timber bracing will be removed before concreting. The steel pin piles will be imbedded in the concrete, with extending pieces cut off.

Completion of the wet well will pace the job, which is to be finished by the end of 1956.

Aside from the wet well and intake structure adjacent to the existing building, the contract includes two new 27x59-ft aerated-type grit chambers to replace an existing battery of three channels, six 3-channel 124x50-ft preliminary sedimentation tanks, two batteries of 4-pass 275x92-ft aeration tanks, two batteries of 4-tank 211x50-ft final sedimentation tanks, four 70-ft-dia sludge concentration tanks, four 81-ft-dia sludge digestors, and one 65-ft-dia sludge storage tank. Also, four new sludge gas-diesel 1,250-kw generators, four 25,000-cfm centrifugal blowers, and additional raw sewage and sludge pumps are to be installed.

• **Drilling old concrete**—A remodeling job is always difficult, but unusually so when large quantities of old concrete have to be removed. Steers is handling the old concrete in the largest size possible, up to 14-ton blocks. The blocks are cut out by drilling with throwaway carbide insert bits much as a saw would do the job if it could. With holes only 2 in. in dia it takes considerable drilling to free a block of concrete. After the slots are cleared of concrete, reinforcing steel is cut off with torches.

Cement and aggregate for concrete are brought to the site by scow and concrete is batched in a floating concrete mixer. Steers first engaged a sub to pump the concrete around the site, which covers 23 acres. After about a month of daily pours up to 400-yd that ran to even 16 and 18 hours, Steers and the subcontractor mutually agreed to abandon this method. Moving the delivery pipe as slab casting proceeded was found much too slow and cumbersome. It was felt that these disadvantages would be emphasized on vertical pours.

The prime contractor then took on delivery of concrete in 4-cu yd batch trucks, first having to build a temporary wharf out to the mixer for the trucks (the pumping operation utilized an existing narrow walk over plant outfall line). Where it took the pumping sub 16 and 18 hours to place and finish 400 yd of concrete, with Steer's trucks that much is easily done in 8 hours.

• **Fabricate steel forms**—Walls in the areation tanks are 15 ft high and flare out at top and bottom. It was first planned to use ordinary wood forms faced with pressed wood. But excessive repair costs caused by difficulties in stripping and slowness in handling, coupled with the fact that Steers would have to build the wood forms, prompted the ordering of specially fabricated steel forms. They were made in 15-ft high 3-ft long sections, but are bolted together and handled in 15-ft long sections. They suffer virtually no damage in stripping and leave a slightly smoother concrete surface than do the lined wood forms. Sixteen re-uses were obtained on this job.

An accurate cost comparison with wood forms is not available, but Steers' chief engineer Eugene Rau figures that, at worst, costs connected with the steel forms equaled those for wood at 16 re-uses. But the steel forms are in excellent shape and will pay off big should Steers secure another sewage plant job.

Although walls of the sludge digester tanks at New York City's two most recently completed sewage plants, Owl's Head and Hunts Point, are of prestressed concrete, those at Bowery

ON 63 MILES OF 36-INCH LOOP requiring trench 6½ feet deep to allow a 30-inch cover for oversize pipe, Associated Pipe Line Contractors, Inc. got high daily footage with two Cleveland 320 Pipeline Trenchers. The job was split into two work sections, one running westward from Magnolia, Miss. to Clinton, La., the other eastward from White Bluff to Collins, Miss.

Associated's spread was part of the Transco main line looping program between Texas and New York. Five of the seven pipeline contractors on the Transco project are users of Cleveland Trenchers and Backfillers.

Get the dope on all the latest improvements on the complete line of Cleveland Trenchers and Backfillers. Talk it over with your Cleveland distributor.

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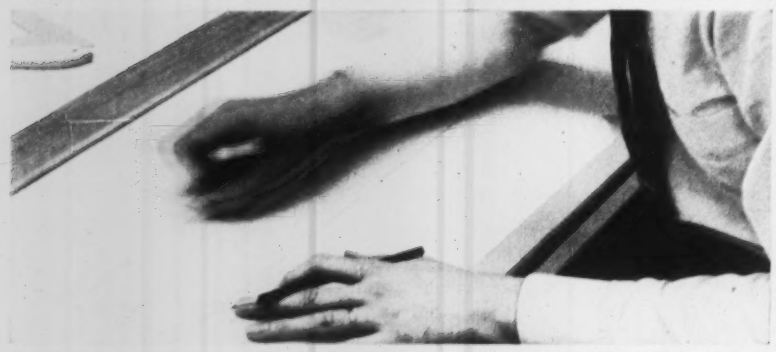
CLEVELAND

DRAFTING TRENDS

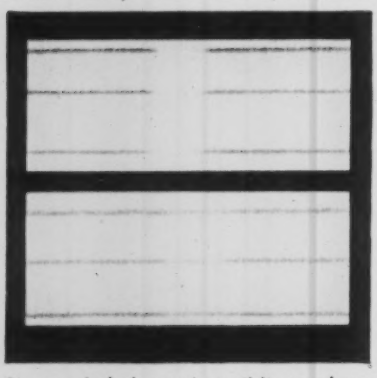


Controlled tests have proved the remarkable erasing qualities of new Blutex tracing vellum.

Improved tracing vellum erases cleaner and faster

A newly improved vellum called *Blutex* has unusual erasing qualities and eliminates "ghosting" on tracings and prints. Manufactured by Post, the product is a revised formulation of an established vellum.

Chief reason for the cleaner erasing qualities is a new combination of transparentizing materials used in treating the base stock. (The base stock itself is exceptionally hard.) Unlike many other vellums, *Blutex* is



Unretouched photos of pencil lines and erasures on Blutex (top) and another leading vellum after identical aging of both sheets.

treated with 100% synthetic resins rather than oils. The carefully selected resins provide a "drier" working surface; dry yet never brittle. This unusual dryness, combined with an extra hard surface, permits faster, cleaner erasures.

The new process also affects the *future* erasability. The materials are specifically formulated to resist heat and aging. The transparentizing agents will not *fuse* with the graphite lines, a common condition in other vellums that make erasures difficult. Laboratory tests have shown that *Blutex* is just as erasable after 100 trips through a printer as it is when first used.

Another Blutex advantage is its fine *drawing* quality. The dry surface and excellent tooth take dense, opaque lines with ease and uniformity.

In addition to these improvements, new *Blutex* is actually more transparent. The new formulation is carefully controlled to preserve the stock while actually increasing the transparency.

Testing samples and information on Blutex is available from the Reader Service Division of the Frederick Post Company, 3651 N. Avondale Avenue, Chicago 18.

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ENGINEERING EQUIPMENT & DRAFTING SUPPLIES • FIELD EQUIPMENT & DRAFTING FURNITURE

Bay are specified to be ordinary reinforced concrete. Alternate bidding was called for on the two previous jobs with prestressing coming in at about $100,000 less over eight tanks at each plant (there are four at Bowery Bay).

It is known that a number of tap-ins are now being made to the tanks at Owl's Head, presumably at much greater expense than if tapping through ordinary reinforced concrete walls.

Another factor probably influencing the city's decision for reinforced concrete at Bowery Bay was the time element. Steers' superintendent, Clayton O'Connell, who also ran the Hunts Point job, believes that the "one-step" placing operation for reinforced concrete walls is faster than the prestressing operation which involves first casting the core, having the prestressing sub come in, then returning to complete the exterior coating.

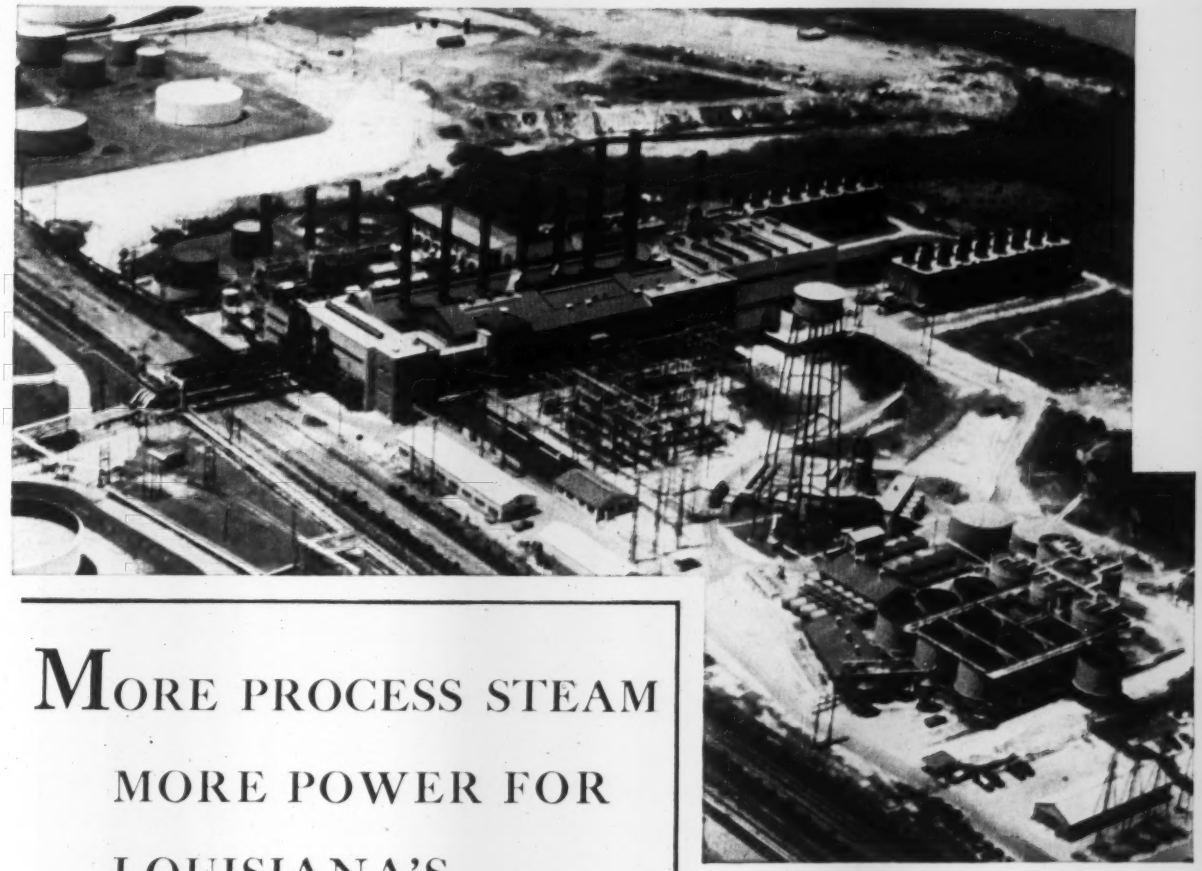
The Steers firm, of New York City, holds a $12.5-million prime contract covering structural work and furnishing of equipment. Other prime contractors are Rao Electric Equipment Co. for electrical work, Astrove Plumbing & Heating Corp. for plumbing, and H. Sand & Co., Inc. for heating and ventilating. Sand also holds a large subcontract from Steers for equipment procurement and installation.

Leo Magid is resident engineer for the New York City's Dept. of Public Works. William A. O'Leary is director of that department's Sewage Disposal Division, under Frederick H. Zurmuhlen, Commissioner. Albert DiGiacinto handled the underpinning work for Spencer, White & Prentis.

Wide World Photo

For Gases and Flags

Sewage lift station gases are exhausted through this combination vent stack and flagpole. The finial atop the 39-ft aluminum structure includes a diffuser plate. Coral Gables, Fla., provides setting.



Louisiana Station, situated north of Baton Rouge, was the first large plant designed to utilize oil refinery residues for as much as one-third of its total fuel requirements.

MORE PROCESS STEAM MORE POWER FOR LOUISIANA'S INDUSTRIES

Louisiana Station of Gulf States Utilities Company was designed and built by Stone & Webster Engineering Corporation in 1930. With an initial capacity of 1,500,000 pounds of steam per hour and 45,000 kilowatts, it was one of the first utility plants to generate electric power as a by-product of the large scale supply of process steam for industry.

To supply the additional requirements of the oil refinery which was its original customer, as well as those of new industries attracted to the area which utilized both process steam and electric power, Gulf States through the years has engaged the Corporation to design and build new units. The most recent addition, just completed, brings the total capacity of the plant to about 6,750,000 pounds of steam per hour and 406,000 kilowatts.

If you have a problem of design or construction, our broad experience in these and related fields may help you solve it. Write or call us for complete information on our services.

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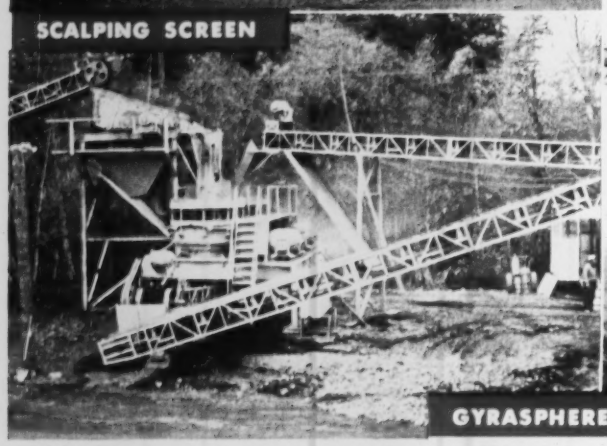
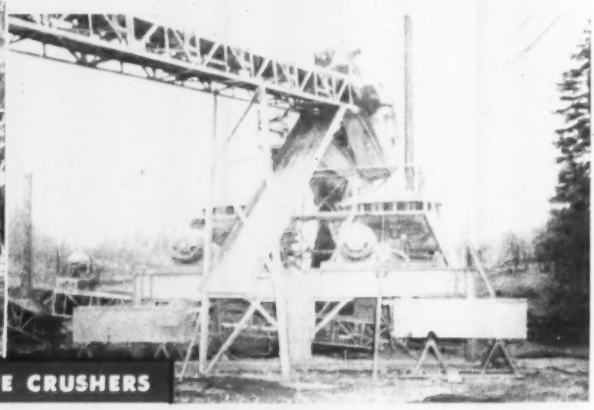


GYRASPHERE CRUSHERS



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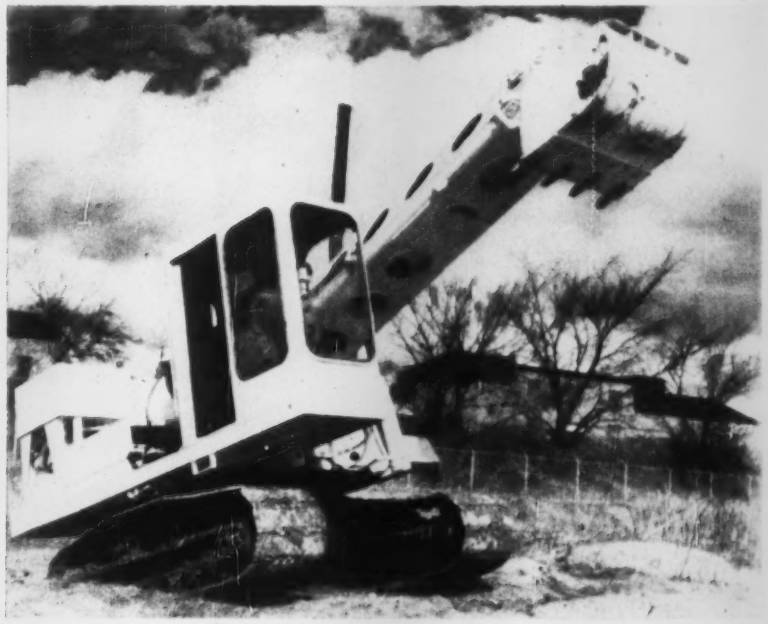
Flattened-sphere Water Tank Features Small Head Ranges

After several successful field installations, Chicago Bridge & Iron Co. now makes formal announcement of its Watersphereoid: a single column watertower with a new flattened-sphere-shaped tank which permits larger storage capacities without excessive head ranges. Whereas the company's sphere-shaped tanks have a 250,000-gal limit, the spheroidal shapes are available in sizes ranging to 500,000 gal.

Difference between high- and low-water lines in the 500,000-gal spheroid, which is 59 ft in dia, is only 30 ft, the same head range of a 150,000 gal sphere which is 34 ft in dia.

Standard sizes of Watersphereoids are 250, 300, 400 and 500 thousand gallons, with alternate head ranges for the two largest sizes. Heights to tank bottoms range from 50 to 125 ft as standard. Tank diameters are 45, 47, 53 and 59 for the four sizes, respectively. Columns, housing ladder, riser, overflow stub and heating and insulation facilities (if required), have diameters of 9, 10, 11 and 12 ft.

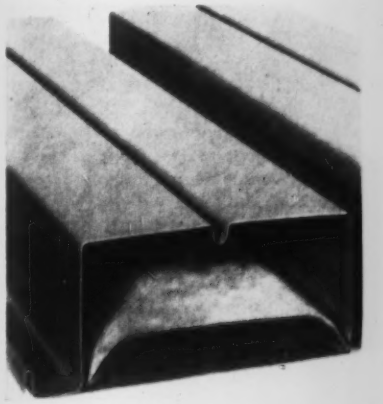
Materials and construction are similar to the ball-shaped elevated structures. CHICAGO BRIDGE & IRON CO., 332 S. MICHIGAN AVE., CHICAGO.



Gradall Moves on New Crawler Mount

A new crawler model of the multi-purpose Gradall has been announced by Warner & Swasey Co. The manufacturer says that the crawler mount has been redesigned for more power, with two speeds available at full power both forward and backward. Simplified controls actuated with one lever regulate the speed of the crawler.

A selection of tracks ranging from 18 in. through 48 in. make it possible to mount the model on tracks with as low as 3½ psi of bearing pressure. Warner & Swasey Co., Cleveland, Ohio.



Arched Acoustic Insulation Stays Free of Water, Paint

A manufacturer of acoustic insulation has developed an arched acoustic insulation pad in 4 ft lengths for use in lightweight, cellular steel acoustic panels.

The new pad is made of glass fibers with a one-pound density. It retains its arched shape through a newly developed thermal-pressure molding process. Purpose of the arch in the pad is to keep the acoustic insulation free of the inside surface of the perforated panels so that painting or washing will not impair its acoustical efficiency.

According to the manufacturer, the new pads will not "dust" in workmen's hands like other glass fiber materials, because of the long, thin fibers used and the new molding process. DETROIT STEEL PRODUCTS CO., EAST GRAND BLVD., DETROIT 11, MICH.

(*New Products continued on page 68*)

No matter what the pipe in your water distribution system

-there's an Eddy valve or hydrant to fit!

EDDY Bronze-Mounted GATE VALVES

offer simplicity of design, trouble-free operation and enduring service. From the engineering drawing boards through all stages of manufacture, they are step by step a truly "finished" product of workmanship. These factors, added to personal experience, are reasons why progressive water works men have relied on Eddy Valves for years. Available with bell, mechanical joint or flanged connections.

EDDY Bronze-Mounted HYDRANTS

are built for dependability and lasting service. They open smoothly *with* the pressure and close against the pressure without water hammer. One man can easily remove all operating mechanism for inspection and repair. Positive drip action automatically drains the standpipe, safeguarding against freeze-ups. Stem held in place below main valve means no water loss due to a bent stem. Equipped with bell, mechanical joint or flanged connections.

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Mechanical joint connections for valves or hydrants are made with standardized mechanical joint ends for use with mechanical joint pipe or with Class D mechanical joint ends to fit all classes of pipe.

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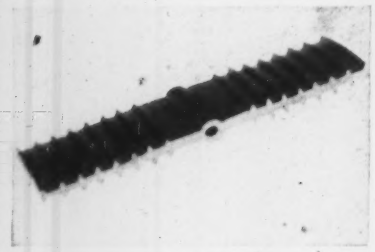
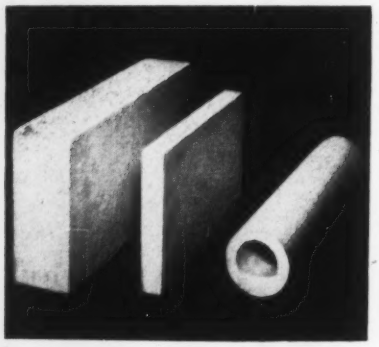


Plastic Waterstop Material

A new plastic waterstop material is available in long coils, in widths from 2 to 9 in. Extruded from thermoplastic polyvinylchloride, it is resistant to acids, alkalis, chlorinated water, lubricating oil and other harmful substances.

The product, named Durajoint, is manufactured with longitudinal ridges for effective bonding to concrete and with a central hollow tube that increases the waterstop's ability to accommodate movement of the concrete without shearing.

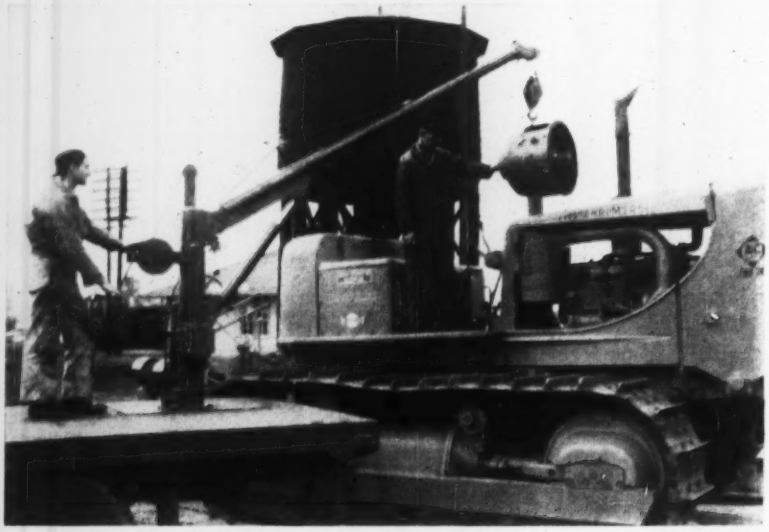
The vinyl plastic has a tensile strength of 1,900 psi and can elongate up to 200% with full recovery. It is designed to function in temperatures ranging from —58 F through 175 F. W. R. Meadows Inc., 7 Kimball St., Elgin, Ill.



New Plastic Slabs, Bricks Offer Wide Range of Uses

Soon to be available in molded slab, brick or block form, a European-developed, expanded polystyrene material, Uni-Crest, is recommended by its U. S. licensee for a wealth of uses. Among these are sandwich panels for exterior or interior walls, perimeter insulation for homes and buildings, and insulation for cold storage rooms and cold lines. In addition it can be used for packaging, display materials and toys.

(Continued on page 70)



Heavy-Duty Crane Is Truck Mounted

A versatile heavy-duty truck-mounted crane is now available for use by contractors. Overall height of the crane from the truck bed, with boom in horizontal position, is 5 ft 6 in. Boom overhang in collapsed position is 6 ft, but extends to a full 9 ft. A heavy duty tackle block takes 5-part line of ½ in. plow steel wire rope.

With a combination of two-speed, hand-operated rotating winch and a double-acting hand hydraulic pump, the crane, called the Blue Heron, is said to be most versatile. The hydraulic pump can be electrified if desired. The crane boom responds smoothly and promptly with heavy loads running up to 4,000 lb. Cam Tool Co., 11 Randwick Ave., Oakland, Calif.

WHEN THE GOING GETS TOUGH

Haddad Construction brings its MARION on the Job

Haddad Construction Company of Columbus, Ohio, has 2 of 4 contracts for constructing a heavy sewer line through seven suburban areas and a portion of East Cleveland. Total length is 10 miles of which Haddad has about 6 miles or 32,000′.

A MARION 362 with a 2-yard hoe dipper was used to dig the first 1,000′; then was replaced by other excavating equipment. Recently at about the halfway mark, when hard, closely laminated blue rock was encountered, the MARION's ruggedness and performance was again needed to remove 5′ of dirt and sandstone and then 10′ of hard blue rock.

The choice of machines was simple. Through experience Haddad officials knew their MARION could outperform any of six makes of excavating equipment they owned. They knew it could take more wear and tear when digging in hard blue rock.

It's the reason a Haddad official said, "Whenever we run into a tough job, we bring in our MARION 362. It really handles the work."

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MARION 32-M	¾	*17½	*25	*25	¾	4
MARION 43-M	1	*27	*35	—	1-1¼	4
MARION 362	1½	37	—	—	1½-2	39
MARION 372	—	43	—	—	—	—
MARION 83-M	2	60	—	—	2-2¼	4
MARION 87-M	—	75	—	—	—	—
MARION 93-M	2½	80	—	—	—	39
MARION 101-M	3	84	—	—	—	4
MARION 111-M	4	169	—	—	—	40

*Rated at 10′ Radius in Accordance with General Practice

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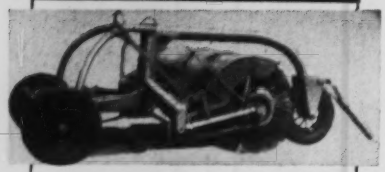
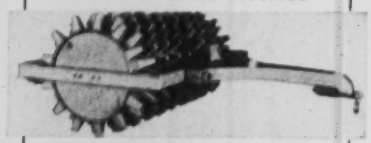
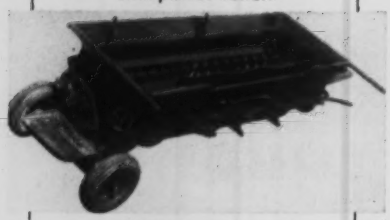


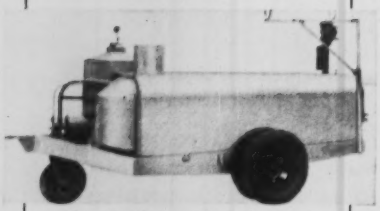
Roadsweepers, traction, engine-driven or tractor-mounted



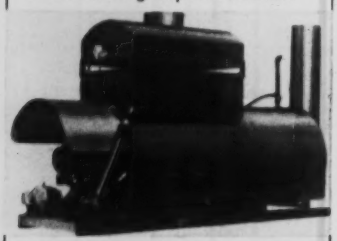
Sheepsfoot rollers



Chip spreaders



Circulating asphalt heaters



Automatic oil heaters for hot plants

Pneumatic rollers, self-propelled or trailed

W. E. GRACE MFG. CO.
6015 S. LAMAR, DALLAS, TEXAS

The material, developed in Germany after the war, consists of "beads" similar to very coarse grains of sugar. Expanded and welded together, the "beads" form a homogeneous snow-white material comprised of minute, individually closed cellules. The material can be produced at any specified density between 1 to 20 lb per cu ft.

Properties cited for the substance are low rate of heat transfer, less than 1% moisture absorption (after total submergence), small coefficient of expansion, high buoyancy, no odor, non-toxic, will not rot. It is claimed to be impervious to parasitic insects, vermin and fungi, as well as unaffected by sun or sea water. With a low dielectric and loss factor, it might have electrical applications, too.

Uni-Crest comes in slab, brick or block form, in lengths up to 12 ft, widths to 4 ft, and thicknesses to 8 in. It can be laminated with wood, steel, aluminum, plastic or fibrous facings. Paints or asphalt may be applied to its surfaces. Uni-Crest Division, United Cork Co., Newark, N. J.

Packing Beneath Forms

Ability to compact soil under both sides of a form at the same time, at the rate of 25 ft per minute, is claimed for the Universal Formpacker. It insures perfect alignment to withstand heavy weights of modern subgrading and finishing equipment.

The formpacker can be set to fit all standard paving forms from 8 x 8 in. to 12 x 12 in. Available in both left- and right-hand models, the machine weighs 330 pounds and is guided by an adjustable handlebar. Kohler Co., Kohler, Wis.

DESK TOP is movable belt that . . .

DOUBLES BACK below on rollers.

Table With Endless Belt Cuts Down Drafting Effort

With the "Draft-a-Matic" drawing desk, a draftsman can work on any area of his drawing from a normal seated position. Fatigue down, efficiency up, claims the manufacturer of this new equipment.

To bring the top of his drawing within easy reach, the draftsman simply turns a handy wheel. While the upper part of the sheet slides toward him, the lower part doubles out of his way beneath the desk top.

The feature that makes this possible is a 48-in.-wide, continuous plastic belt, which serves as the work surface. Turning on rollers mounted along front and back edges of the 60x36 in. desk top, the belt slides over the desk top and backtracks beneath it.

The belt zips off for cleaning or replacement. Its vinyl surface "heals" pencil grooves and compass holes.

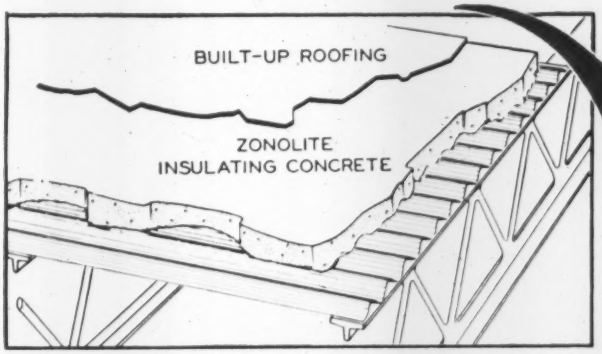
Since the moving belt takes care of the main advantage of standing—ability to reach any part of a drawing—Draft-a-Matic is made normal desk height, 31 in. It can be raised, however, in 1-in. increments to standing height of 39 in. Tilt can vary, too—from horizontal to 85 deg.

Other features include all-metal construction and, for the next drafts-

(Continued on page 75)

How Zonolite® Vermiculite CONCRETE
Poured-In-Place Over Corrugated Metal

NOW MAKES POSSIBLE LOW COST • LIGHTWEIGHT • FIRESAFE INSULATING ROOF DECKS!



Zonolite concrete over corrugated metal...Diagram of roof deck just completed on huge shopper's mart in Bridgeville, Pennsylvania.

Pouring 300,000 sq. ft. of vermiculite concrete gets underway.

This type of joist used where span exceeded 25 ft.

Placing corrugated metal.

Side clips fasten corrugated metal to bar joists.

Mixermobile. Zonolite concrete being hoisted to roof.

Easy pouring from concrete buggy. Bulb tee used for screed.

View on the W. T. Grant Co. store—3" Zonolite concrete over metal. Super fire-safe.

Construction Superintendent says this deck went on 20% faster.

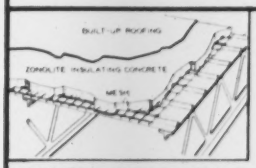
The construction industry has found the new Zonolite roof deck systems to be *superior to all others.* This shopper's mart in Pennsylvania (300,000 sq. ft. of Zonolite deck and marquees) went on 20% faster than another type deck used on part of the same job. Also, it was lighter weight and excelled in fire-safety, saving $1,000 a year on insurance premiums. This Zonolite-over-corrugated-steel and the four other systems shown here are only a small portion of the combinations now made possible. Send for free booklet "Systems of Lightweight Construction."

ZONOLITE COMPANY

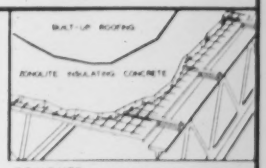
135 So. LaSalle St., Chicago 3, Illinois

These Lightweight Decks Excel in Fire-safety, Permanence!

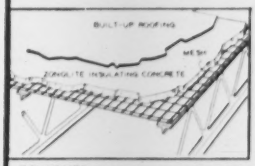
And Zonolite Is Adaptable To Any Roof Deck Design



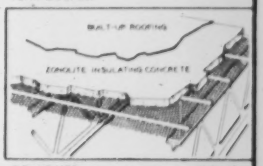
ZONOLITE concrete over metal deck.



ZONOLITE concrete over various form boards.



ZONOLITE concrete over paper-backed wire lath.



ZONOLITE concrete over ribbed metal lath.

Get This FREE BOOK

Just off the press. A book you'll want for quick reference...gives details of many roof deck systems...including design data, section drawings, ratings, etc. No obligation. Mail coupon.

MAIL COUPON TODAY

Zonolite Company, Dept. EN56
135 S. LaSalle Street, Chicago 3, Illinois

Please send me your new booklet, G-101 "Systems of Lightweight Construction."

Name _____

Firm Name _____

Address _____

City _____ **Zone** _____ **State** _____

Architect _____ **Builder** _____ **Other** _____

LOOK AT REO

Reo "perfect square" short stroke (bore and stroke exactly the same) insures smooth, full-volume engine breathing for top fuel economy and peak power output — as much as 1/2 h.p. per cu. in. displacement. Better breathing combined with less piston travel, less wear, less power loss due to friction gives you greater engine efficiency, more responsive horsepower. You get better gas mileage —longer engine life.

Wet-sleeve construction adds to short-stroke efficiency and extends new engine performance—original factory tolerances are restored exactly even after years of rugged service and several overhauls. Overhaul downtime and cost are cut in half.

REO BUILDS ONLY COMPLETE LINE OF SHORT-STROKE, WET-SLEEVE ENGINES

for short-stroke and wet-sleeve

Reo builds the only complete line of truck engines — V-8's (195-220 h.p.) and sixes (107-160 h.p.), gas or LPG—with both short-stroke and wet-sleeves throughout. All are backed by *100,000 mile or 1 year warranty.*

Reo Gold Comet V-8's are up to 35% more efficient than the industry average. They develop a startling 1/2 h.p. per cu. in. displacement. They deliver more usable horsepower to the wheels. They are, pound for pound, the most powerful truck engines on the road today.

Ask your Reo representative about the advantages of Gold Comet power. You can get it in a rugged Reo truck or for replacement in other truck makes. Call your Factory Branch or Distributor today.

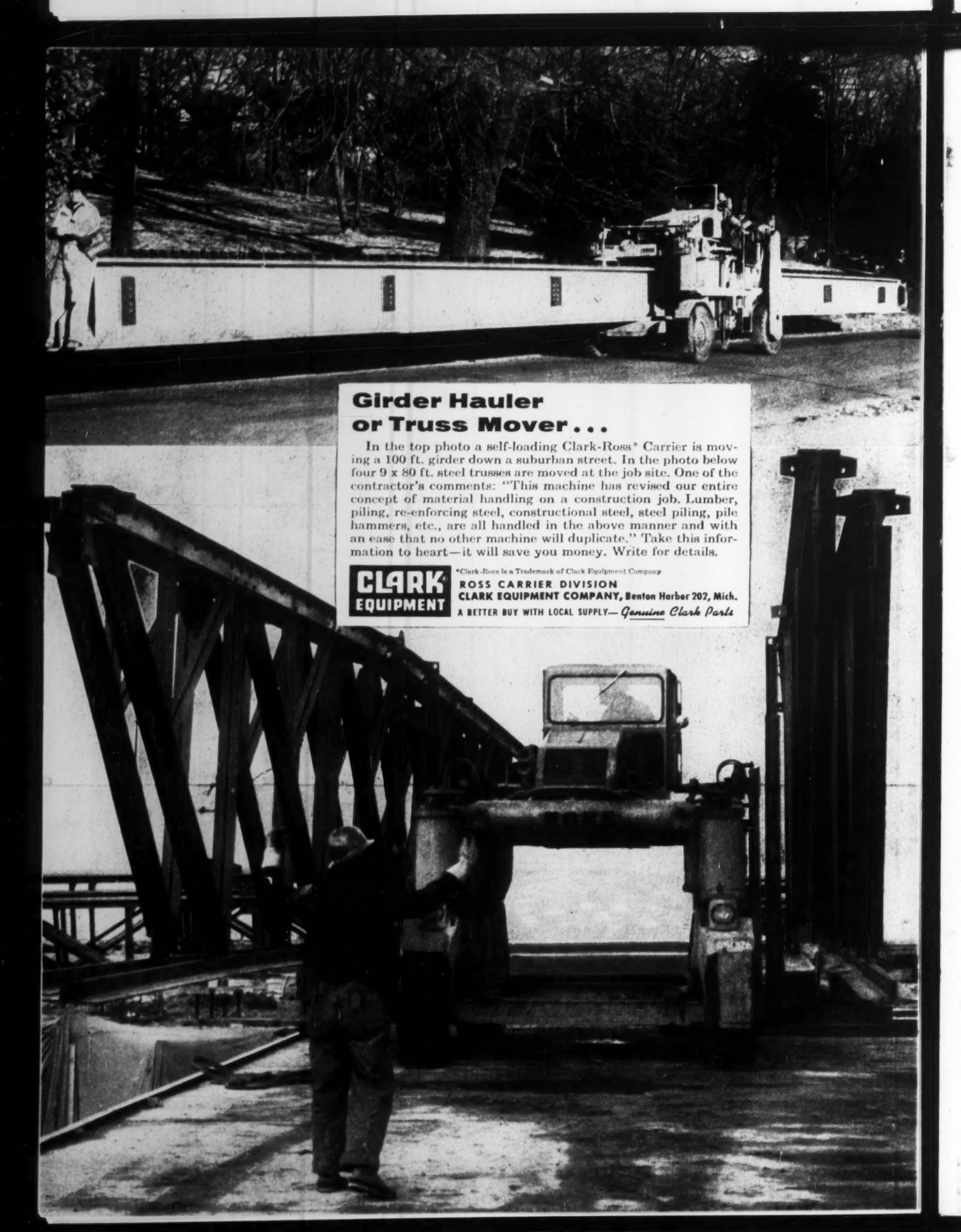
REO MOTORS, INC.

LANSING 20, MICHIGAN • TORONTO, ONTARIO

SUBSIDIARY OF BOHN ALUMINUM AND BRASS CORPORATION

Trucks, Buses and Gold Comet Engines For Original Equipment, Industrial and Replacement — Gas or LPG.

. . . ALL BACKED BY REO'S 100,000 MILE OR ONE-YEAR WARRANTY



Girder Hauler or Truss Mover . . .

In the top photo a self-loading Clark-Ross* Carrier is moving a 100 ft. girder down a suburban street. In the photo below four 9 x 80 ft. steel trusses are moved at the job site. One of the contractor's comments: "This machine has revised our entire concept of material handling on a construction job. Lumber, piling, re-enforcing steel, constructional steel, steel piling, pile hammers, etc., are all handled in the above manner and with an ease that no other machine will duplicate." Take this information to heart—it will save you money. Write for details.

CLARK EQUIPMENT

*Clark-Ross is a Trademark of Clark Equipment Company

ROSS CARRIER DIVISION
CLARK EQUIPMENT COMPANY, Benton Harbor 202, Mich.

A BETTER BUY WITH LOCAL SUPPLY— *Genuine Clark Parts*

man up the line, storage space and a pull-out reference surface at the back.

Four models are made, differing in arrangement of drawers and other storage space. THE GENERAL FIREPROOFING CO., YOUNGSTOWN 1, O.

High-Voltage Splicing Tape Features Short Fusing Time

A high voltage splicing tape, employing a butyl rubber base, possesses a dielectric strength of 650 volts per mil. Intended for use as primary insulation on splices made on all insulated cables using ozone resisting compounds, it passes ozone resistance test MIL-I-3875.

After application, this No. 23 electrical tape fuses into a homogeneous mass, yielding good moisture resistance. A 900% elongation factor enhances the tape's conformability—even at cold temperatures. Five minutes after application, it is claimed, the tape cannot be removed without rupture.

The tape has no corrosive effect on copper or silver and is said to be extremely workable, elastic but tough. It is compatible with overwrap tapes. MINNESOTA MINING & MFG. CO., 900 FAUQUIER ST., ST. PAUL 6, MINN.

Glass-Fiber in New Plaster Replaces Sisal and Hemp

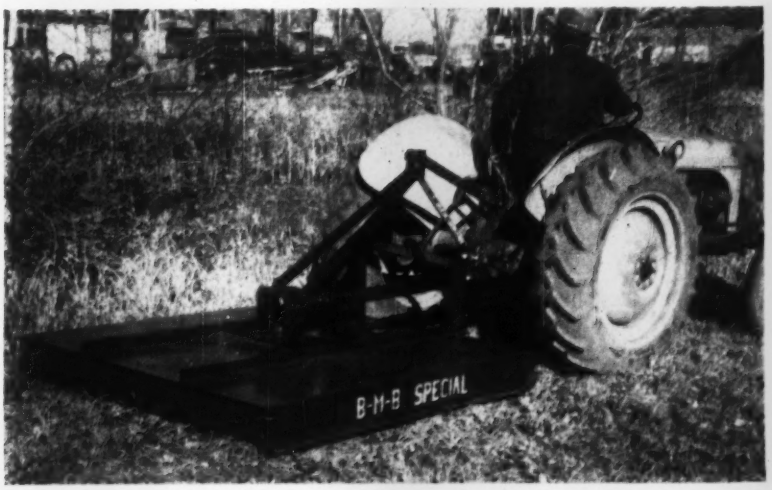
Glass fiber replaces sisal and hemp in a patented gypsum plaster called "Bestwall." Fibers used are the same as those in glass cloth for draperies. They are said to be soft, flexible, non-irritating, and stronger than some steels.

The short glass threads in Bestwall outnumber the fibers in other fibered plasters by 30 to 40 times but weigh 150 to 200 times less, singly, according to the makers. This causes even distribution of fibers, with the result that the plaster spreads smoothly, works easily, "keys" better to lath, and does not pile up on mixer blades and other surfaces. CERTAIN-TEED PRODUCTS CORP., 120 E. LANCASTER AVE., ARDMORE, PA.

Diesel Truck Exhaust Brake Ups Engine Retardation 50%

By means of a simple butterfly valve in the exhaust line, back pressure is created to transform the engine to an air compressor and thus augment full engine braking in a new exhaust brake announced recently by Mack Trucks.

An electro-pneumatic control system enables the new brake to assist



Economy in Controlling Undergrowth

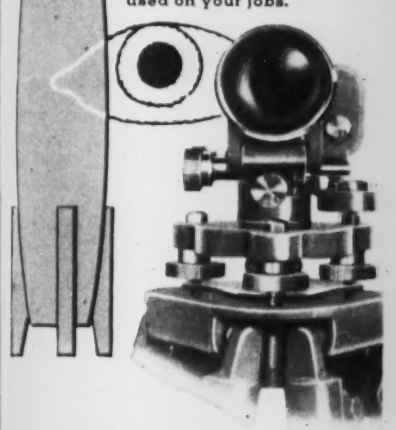
With a low purchase price, the 5-ft lift-type BMB "Special" rotary cutter is said to provide maintenance crews with an easier and more economical way of controlling undergrowth.

The cutter is said to be light in weight, easy to assemble and operate. A three-point hookup attaches quickly to any tractor and will not overload the machine. Additionally it has full-length skid shoes and one pair of swinging-type blades that contract automatically when an obstacle is hit. The machine is equipped with a 50-lb flywheel that maintains blade speed through clumps and bunches, and a full 30 hp gear box that will withstand long hard use. BMB Co., Inc., 319-21 New York Ave., Holton, Kan.

You're Not Behind The Times IF You're Behind a

KERN INSTRUMENT

Obsolete surveying tools are time-consuming, wasteful . . . out of step with modern construction equipment used on your jobs.



KERN THE MOST MODERN surveying instruments available. Down-to-fundamentals, functional design . . . maximum operational efficiency and portability . . . reliable precision results.

KNOWN THE WORLD OVER
for accuracy, speed, reliability, economy.

- Minimum set-up time
- Fast, effortless, simple operation
- Readings at a glance
- Exceptional clarity and contrast of image

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PROMPT, RELIABLE SERVICE
FACTORY TRAINED PERSONNEL

Kern and Only Kern Offers You The Latest Designs of

Dr. Henry WILD

Kern SWISS *The FINEST in SURVEYING EQUIPMENT*

KERN INSTRUMENTS INC.
120 Grand St., White Plains, N. Y.

The ground gave way

...but our Hartford Contractors' Equipment policy gave us the solid protection we needed!

(Based on Company File #9A003123)

Just as we were inching our crane around the pilings on a river bank, the ground gave way . . .

Of course the accident *would* happen to a brand-new rig! We'd had it less than six weeks. And there it was—wrecked.

I called my Hartford Agent. He set my mind at rest immediately. He reminded me of the automatic 45-day protection we had on new equipment under our Hartford policy. And he had an adjuster on the job in a matter of hours.

There wasn't any red tape. Not a bit! We repaired the crane. The Hartford Fire Insurance Company promptly paid us $3,232.10.

Your investment in equipment ties up a lot of your money. Too much to take chances with.

So play it safe. Get the broad coverage offered by a Hartford Contractors' Equipment Policy. Then you're covered against loss by overturn . . . collision . . . fire . . . theft . . . explosion and other specific hazards.

No time like *now* to look into this. Call your Hartford Fire Insurance Company Agent or your insurance broker today. You'll be glad you did.

Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company
Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey . . . *Hartford 15, Connecticut*
New York Underwriters Insurance Company . . . *New York 38, New York*
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company . . . *Minneapolis 2, Minnesota*

the conventional braking system in slowing down or bringing the vehicle to a stop or in retarding speed on downgrades. The new exhaust brake is under the driver's control constantly, a simple three-position switch permits the exhaust brake to actuate automatically whenever the brakes are applied, to respond when the accelerator is released or to be cut out of action entirely. Power to operate the butterfly valve is supplied by an air cylinder connected with the regular air brake system, a magnet valve controlling the admission and exhaust of air. MACK TRUCKS, INC., 350 FIFTH AVE., NEW YORK 1, N. Y.

Add Bigger Machine to Link-Belt Shovel-Crane Line

Link-Belt Speeder Corp. has announced the addition of the largest production model shovel-crane yet produced by the company—the 3 cu yd K-608.

Crawler-mounted, K-608 is said to be readily convertible to shovel, crane, dragline, clamshell and piledriver attachments. The rig is designed for a 3-yd shovel operation, with a rated crane lifting capacity of 75 tons at a 12-ft radius. THE LINK-BELT SPEEDER CORP., CEDAR RAPIDS, IOWA.

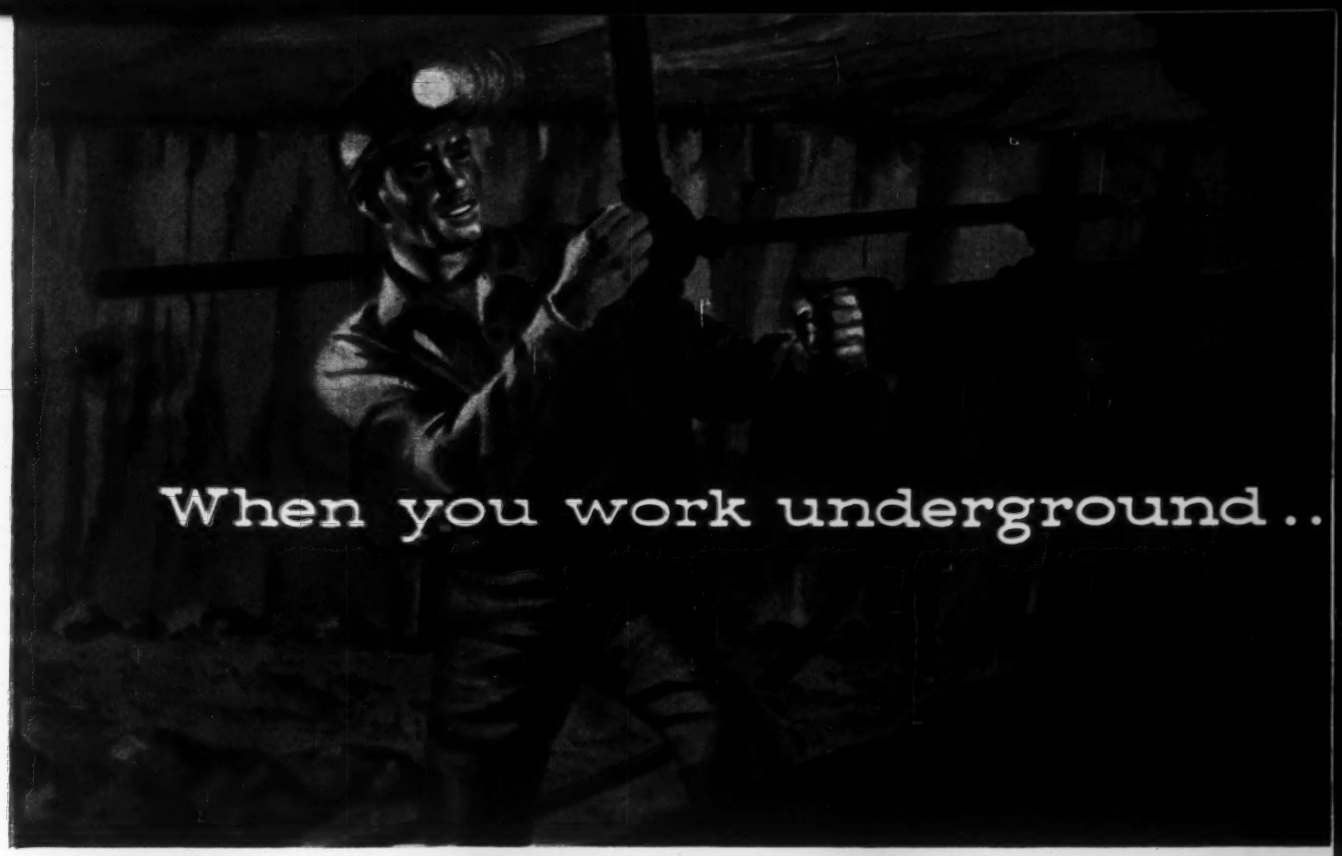
Introduce Hydraulic Trowel For Concrete Finishing Jobs

A new hydraulic trowel for floating, leveling and troweling of concrete surfaces has been announced under the name of the Kelley Hydra-Trowel. Six models are to be made available, three 34-in. dia and three 44-in. dia, powered either by gasoline or electricity.

Claimed to be the only hydraulic trowel on the market, the machine does its work with four blades, driven through a gear reducer. The blades, at 90 deg to each other, are mounted independently of the stationary guard ring, thus cannot be misaligned when the machine is picked up and carried by the guard ring.

Pitch of the four blades is changed by a hydraulic system controlled by a lever on the handle. Because of the cushion effect of the hydraulic system, the machine will not tip or jolt if the blades pass over a loose piece of aggregate. Blades, of heavy-gage spring steel, are high pitch and can be used for both floating and finishing, eliminating the need for changing blades when these two operations are done. THE KELLEY MACHINE DIVISION OF WIESNER-RAPP CO., 285 HINMAN AVE., BUFFALO 23, N. Y.

(*New Products continued on page 78*)



you not only must locate your objective, but you have to bring it to the surface

at a profit!

That is where Operations Research may solve your problem.

There are probably more variables in Geology than any other field. The physical composition of the earth itself is far from orderly. For example, you've read about discovery of uranium along a railroad right-of-way, oil wells in the ocean, flood waters raging through cities and towns.

Manu-Mine's experience and abilities in Geological Engineering and Operations Research are unique. Mining, water control, highways, soil solidification, industrial waste disposal, bridge and damsite engineering—these are the fields the men of Manu-Mine know best.

In solving difficult problems in many parts of the world, new techniques have been developed by our own engineering staff—one of the largest independent groups of geological engineers.

If your company makes its living *in* or *with* the ground, you should investigate Manu-Mine's conception of Operations Research.

GEOTECHNICAL PROJECTS:
Geology and geological engineering, geophysics, geochemistry, soil mechanics and soils testing.

MINING ENGINEERING:
Shaft-sinking and tunnel-driving, ventilation, mine evaluation, development, roof control, fire control.

MANU-WALL CONSTRUCTION
Retaining walls, damsites, viaducts, and other construction relating to the control of water.

FOUNDATION ENGINEERING:
Soil stabilization, water control, ground-bearing support.

CERAMICS:
Research for the ceramic industry. Studying special problems for the brick and clay products industries.

SOIL SOLIDIFICATION:
Stabilization of foundations, control of water in tunnels, solidification of fluid soils.

NUCLEAR RESEARCH:
Research in radioactive waste disposal, agricultural problems and nuclear energy.

HIGHWAY DESIGN:
Special studies in geology and surface stability, sub-base stability of road slabs.

RESERVOIRS:
Rehabilitation and construction. Storage of liquids in open and underground pits.

MANU-MINE
Research & Development Company
Reading, Pennsylvania

MANU-MINE

The THORO System of Masonry Protection

THOROCLEAR

Invisible Water Repellent

Ask your dealer about this powerful silicone water repellent developed by years of research by General Electric Company and now produced by us for your protection. *Ask for Circulars No. 30 and 31.*

No change in color or texture of brick, limestone, sandstone, tile or stucco surfaces. Applied by brush or spray.

Keep water out of your masonry walls and protect interior plaster, paints and expensive furnishings.

THORITE

20 Minute Set Patching Compound

Repair those broken sills, steps, concrete floors, chimneys and other defective masonry! *Ask for circular No. 20.*

THOROLOK NO. 100

Use it for your basement or factory floors. New, with special alkali resistant pigments. *Ask for Color Card 32-C.*

Manufacturers of

WATERPLUG, THOROSEAL, QUICKSEAL

for all types of masonry protection!

GET OUR PICTORIALLY DESCRIBED LITERATURE "HOW TO DO IT"

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNSYLVANIA

Publications

Pipe installation guide—Johns-Manville has issued a 108-page instruction manual titled "Transite Ring-Tite Pressure Pipe Installation Guide". Published as a pocketsize manual, it is intended for use on the job, and it includes instructions on every step in pipe installation from receiving through repairs. The manufacturer urges: Put it in your pocket; keep it on the job; and use it.—Johns-Manville, 22 E. 40th St., New York 16, N. Y.

Sound-absorbing pipe—A wire-reinforced rubber pipe intended to eliminate noise and vibration from water lines is described in a new catalog. Operating characteristics for pipe ranging from ½-in. ID to 12-in. are described for temperatures ranging to 180 F and pressures up to 250 psi. Ask for Catalog SZ-55.—T. R. Finn & Co., Inc., Industrial Div., 200 Central Ave., Hawthorne, N. J.

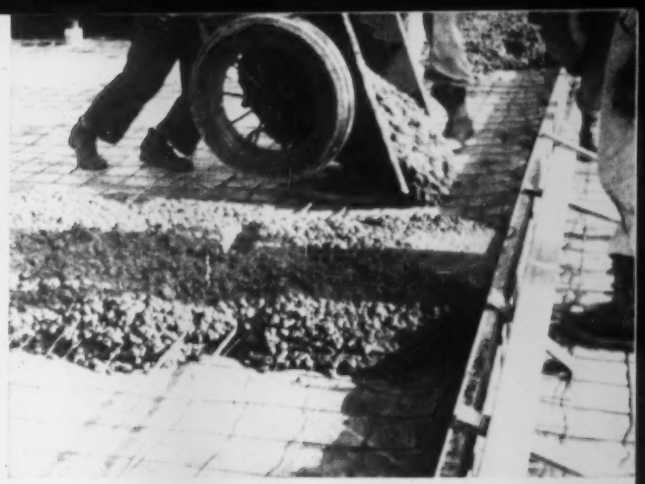
Concrete on a balloon—A new 17-page booklet containing 10-plus pages of photographs describes the uses, advantages and construction methods for "Airform"—a method in which a pneumatic (neoprene-nylon) form is inflated, serving as the form for shotcrete. After the concrete has set sufficiently, the pneumatic form is deflated and can be reused. Shown are grain storage bins, class rooms, a wine processing plant, and underground liquid storage tanks. Waterval Enterprises Ltd., Box 145, Leesburg Pike, Virginia Heights, Alexandria, Va.

Calking and glazing compounds—A four-page brochure gives information on synthetic-rubber calking and glazing compounds made from "Thiokol" liquid polymer. Applied with a calking gun, compounds based on this liquid polymer are used in curtain wall and conventional construction for glazing windows, sealing panels, in control joints, sealing flashing and bedding louvers. Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton 7, N. J.

Portable generators—A four-page folder includes a checklist on how to choose the correct portable powerplant for every job, with charts illustrating the amount of watage needed to run various types of power tools. Also shown are specifications of the new generator and photos of these at work. Master Vibrator Co., 265 Stanley Ave., Dayton, Ohio.

(Publications continued on page 80)

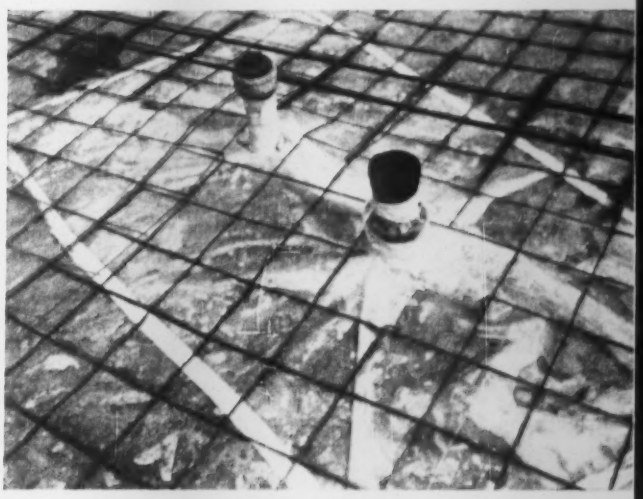
To form a moisture-vapor barrier under a concrete slab foundation, polyethylene film is laid over a bed of sand for protection against sharp objects.



Strips of polyethylene are lapped about 6 inches, and base overlaps are secured to the wall with asphalt. Steel mesh is laid over the polyethylene, and concrete then poured in the usual way to form the slab.

How to use polyethylene film for

Lower cost, better moisture barriers



Pipes and electrical outlets protruding through holes cut in the strips are wrapped tightly in small sheets of film. They are sealed around the outlets and to the main barrier with tape before the mesh is laid down. This application was developed by **The Visking Corporation,** Terre Haute, Indiana.

Builders have hardly begun to take advantage of film made of BAKELITE Brand Polyethylene for a variety of construction jobs. Polyethylene film is so very light in weight, flexible even in extreme cold, low in cost and installation time, and strong (in addition to being unaffected by lime and other chemicals) that it is ideal for waterproofing under showers, indoor planters . . . for air and dust barriers for walls and subflooring . . . for covering and protecting materials and equipment from weather out on the job . . . and other applications.

"Visqueen" film made of BAKELITE Polyethylene comes in rolls up to 32 ft. wide and in a variety of thicknesses. It is easily cut, stapled, or heat sealed. See your building supply dealer. Or write Dept. NG-49.

It pays to specify film made of

BAKELITE
Polyethylene Plastic

BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

STRONGEST FASTENATION

at Hollywood and Vine...

A dozen floors above the street, in America's new Tower of Music, this workman anchors steel channel as easily as squeezing a trigger—driving fasteners straight, deep and powerfully into solid concrete with the RAMSET® DUO-JOBMASTER.

Complete flexibility with DUO-JOBMASTER

Both ¼" and ⅜" fasteners are set with the same tool, the new RAMSET DUO-JOBMASTER. It's the famous RAMSET tool with two interchangeable barrels—to handle *every* fastening job with any style or length fastener.

THE CAPITOL TOWER, spectacular new home of hi-fi Capitol records, dominates the heart of Hollywood, California.

First circular office building in the world, it was designed by architect Welton Becket; contractor is C. L. Peck. The $2 million structure is 13 stories high, acoustically engineered for minimum sound disturbance; has underground reverberation chambers with foot-thick concrete walls buried 25 feet into the earth.

NEED A KILN GUN?

Designed to dislodge clinker rings from rotary kilns, Western's Kiln Gun (now sold by Ramset) removes all types of stubborn, inaccessible obstacles. Write for complete details.

No matter what the construction problem, if it requires fastening to steel or concrete, RAMSET will do it better, faster, cheaper. Ask for new free catalog, just ready for you.

Ramset Fastening System
WINCHESTER-WESTERN DIVISION
OLIN MATHIESON CHEMICAL CORPORATION
12107-E BEREA ROAD • CLEVELAND 11, OHIO

. . . Publications

More water from wells—"Acidizing Service for Water Wells" is the title of a folder describing means of increasing water yield by enlarging formation channels and by removing scale deposits from pumps and screens. This service is intended also for use on new water wells to bring them to maximum level of water production. The company offers to analyze the well problem and bring its own equipment for corrections or improvement. DOWELL INC., TULSA, OKLA.

Submersible pumps—A loose-leaf technical bulletin covering pump types, electrical data and prices, has been made available. It includes information (with examples) on how to select a submersible pump and its proper electrical equipment; how to install it; what performance to expect, shown in performance curves and how much to pay for the various units and accessories. PFLEUGER SUBMERSIBLE PUMPS, INC., LANCASTER, PA.

Structural plastics—Describing a wealth of uses for structural plastics, a 20-page booklet tells the tale of the material's development. Mentioned are windowpanes, translucent and transparent partitions, skylights and sheeting, escalator and elevator components—all from reinforced plastics. Described with pictures are a plastic radar shelter (ENR Sept. 29, p. 303), a shelter to house electronic equipment, aircraft bubbles, boat hulls, helicopter components, water tanks, acid resistant exhaust systems and others. Copies available from LURIA-COURNAND, INC., HAVRE DE GRACE, MD.

Chlorine feeder—Model HCVS vacuum chlorine gas feeder is described in a 4-page bulletin. It delivers up to 8,000 lb per 24 hr to an injector and thence a chlorine-water solution runs to the point of application. BUILDERS-PROVIDENCE, INC., 345 HARRIS AVE., PROVIDENCE, R. I.

Monotube overhead sign supports—Catalog 88 illustrates how and why Monotube Overhead Sign Supports aid traffic flow and safety on highways, freeways, turnpikes and expressway interchanges. UNION METAL MANUFACTURING CO., CANTON 5, OHIO.

Trowel tools—A complete catalog of tools for the trowel trade is now available, giving complete illustrations and specifications for all types of float, mask, mechanical troweling machines and other equipment. GOLDBLATT TOOL CO., 1910 WALNUT ST., KANSAS CITY 8, MO.

BEAMS THAT CARRY MORE LOAD WITH LESS WEIGHT. Inland's new structural mill now provides Midwest builders with a dependable source for Wide Flange Beams, Light Beams and Joists. Far stronger per unit of weight than standard beams, Wide Flange Beams save from 8% to 35% in weight alone and make possible longer spans with fewer intermediate supports. An important extra advantage of the Inland beam is the fact that its inside flanges are parallel, without taper, which simplifies the job of making connections and speeds construction. Wide Flange Beams available in sizes ranging from 8"-24".

How steelmaking progress helps you

BUILD BETTER FOR LESS

Many of the advances in architecture and construction techniques in recent years have been due to the improvements in the construction industry's most vital single material—steel. Steel now performs jobs that would have seemed miraculous a few decades ago. New types of steel have made possible better buildings and faster, more efficient construction. For instance, today's structural steels give more strength with less weight. A new galvanizing process gives steel far superior protection against corrosion. Advanced methods of fabricating steel floor and roof sections have speeded up construction and made buildings far more functional.

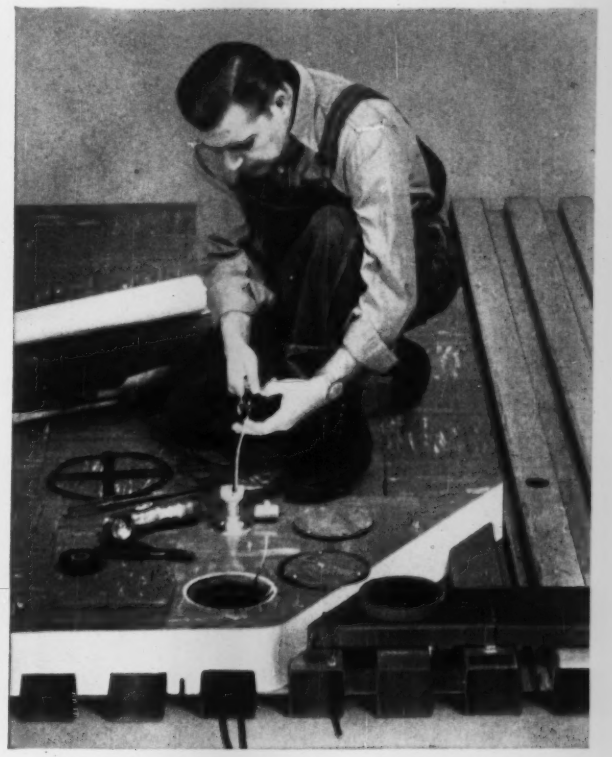
As a major supplier to the construction industry, Inland has consistently expanded and modernized its facilities to provide the new and better structural steels that help you design better and build better . . . for less. For more about Inland products for the construction industry, please turn the page.

A COMPLETE LINE of structural steel shapes, including Wide Flange Beams, Wide Flange Light Beams, Wide Flange Joists, American Standard Beams, H-Beams, American Standard Channels, Equal Angles, Unequal Angles, Zees, and Bulb Angles, in the sizes you need, are available at Inland.

INLAND SUB-PURLINS are specially designed to provide a lighter, more efficient member for poured or pre-cast tile roof construction. Rolled from selected rail steel, they are cut to fit your particular job. They can be quickly and easily installed, without waste, providing lateral support, bridging or anchoring for the main purlins.

RUGGED INLAND 4-WAY* SAFETY PLATE offers a wide variety of ways to cut construction costs and make almost any structure safer and easier to maintain. Rolled from open hearth steel, 4-WAY can be used to provide structurally strong floors, ramps and stairs, often eliminating sub-floors and extra bracing. Specially designed slip-resistant tread provides safe traction for feet and wheels.

CELLUFLOR simplifies design, speeds construction, reduces costs.



CELLUFLOR provides for in-floor wiring to outlets any place any time at low cost.

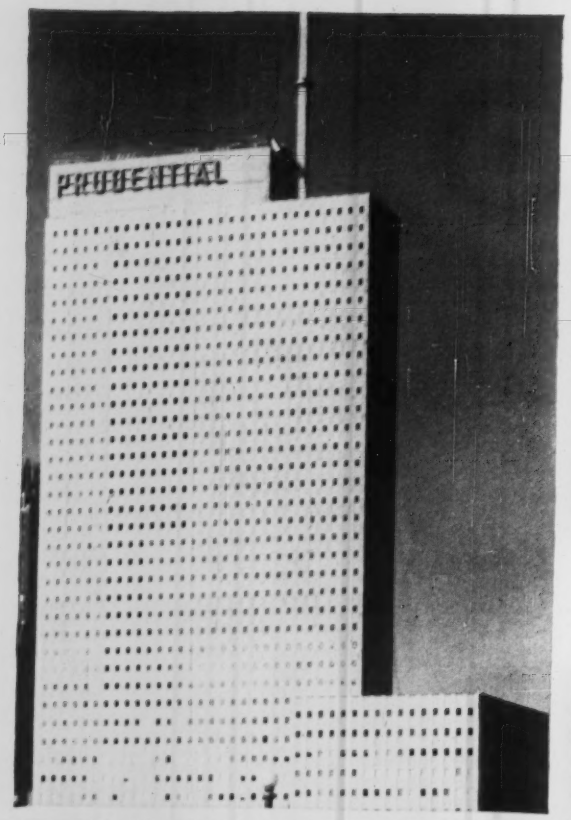
MILCOR CELLUFLOR* PERMITS LIGHTWEIGHT DESIGN, SPEEDS CONSTRUCTION AND PROVIDES ELECTRICAL FLEXIBILITY

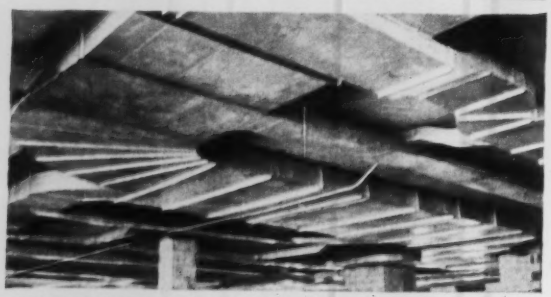
MILCOR CELLUFLOR, manufactured by Inland Steel Products Company of Milwaukee, illustrates how engineering with steel can result in more functional design and lowered building costs. CELLUFLOR permits engineering freedom for the design of the newest light weight structures. Once installed, it provides a perfect work and storage platform for all trades.

Because it is made of durable Inland TI-CO Galvanized Steel, CELLUFLOR easily withstands the ravages of weather and construction traffic. In the finished building, CELLUFLOR insures electrical flexibility required to meet tomorrow's wiring needs. Its raceways, spaced on 6-inch centers, permit the installation of power anywhere. Outlets may be easily moved at low cost.

MILCOR STEEL ROOF DECK, long the standard of closed-rib decks, is now available in three new profiles—each with special features to fit job requirements. All three styles are quickly erected in any weather, all are available with either a TI-CO galvanized finish or with a baked enamel prime finish on a Bonderized base. Typical of a low-cost Milcor Roof Deck application is the Milwaukee County Stadium (left), home of the Milwaukee Braves. Milcor Steel Roof Deck was used to cover the stands. A bonded roof coating of asphalt insulation and 3 ply roll roofing was then applied to the top of the deck.

**Registered Trade Mark*

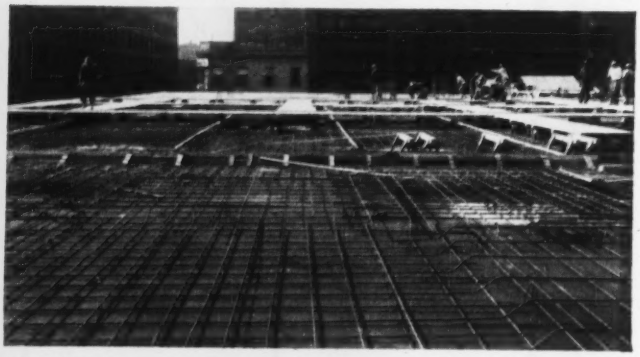




MORE THAN 1,000 TONS of Inland TI-CO* galvanized sheets went into the duct work and air handling equipment for Chicago's giant Prudential Building. TI-CO galvanized sheets were specified for the job (largest sheet metal installation in the Midwest) because the zinc coating stands up under the toughest punishment without cracking, flaking or peeling, keeping rust sealed out. TI-CO sheets are made by a patented continuous galvanizing process which applies a zinc coating that is extremely tough, yet just flexible enough to resist hammering, bending and lock-seaming without cracking.

Registered Inland trade name

A GOOD MAN TO TALK TO when it comes to engineering or estimating problems is your Inland representative. Through him you draw on the wide experience of Inland specialists in construction problems. You'll get expert help in selecting steels and estimating costs.



INLAND HI-BOND* REINFORCING BARS have deep, reversed, double-helical ribs which provide a mechanical grip to give maximum bond in concrete, thus permitting greater use of steel's potential strength in concrete construction. HI-BOND's design also improves transfer of stresses, crack control and resistance to slip . . . advantages that will make possible higher design stresses and thereby lower construction costs. HI-BOND meets standards set up by ASTM A305.

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INLAND

Brazil Uses Own Steel in Skyscraper

Foundation work is under way in Sao Paulo, Brazil, for a 21-story office building that will mark a milestone in Brazilian construction. Called Palacio do Comercio, it will be Brazil's tallest steel-framed building—seven stories taller than its nearest competitor.

Even more significant is the fact that the steel will be supplied from the steel mill at Volta Redonda, which has increased its production enough to satisfy Brazilian engineers' demands. While Brazilian mills are not yet capable of rolling wide-flange beams, the mill at Volta Redonda can now turn out I-beams up to 20 in. deep.

To cost $20.1 million, the new building will be of composite construction. I-beams with steel rings along the top flange will be helped in carrying loads by the concrete floor slab in which the rings will be embedded.

Into the new building will go 1,450 tons of structural steel (more than the 1,100-ton monthly output of Volta Redonda). Exclusive of the foundation, 3,900 cu yd of concrete will be used. The building will rest on 22 reinforced concrete caissons sunk to a depth of about 65 ft.

The new building, to be completed in late 1958, will offer 258,000 sq ft of floor space. The basement will be made into the biggest drugstore in Brazil, stores will occupy the first four floors, and 243 offices (each with separate washroom) will occupy the tower section.

Chief engineer is Paulo Fragaso, architect is Lucjan Korngold, and the owner of the new structure is Henryk Zylberman. Supervision of erection of the steel frame will be by Volta Redonda engineers, who are going to the U. S. to make a study of steel-frame construction. Structural work is expected to start by September.

BRAZIL'S TALLEST steel-framed building as shown in artist's rendering.

Thames Tunnel—17 Years Later

Construction of a mile-long traffic tunnel beneath the Thames will get under way in a few weeks—nearly 17 years after completion of the pilot tunnel.

Work on the $28-million toll project between Dartford and Purfleet was halted at the beginning of World War II. Now completion is scheduled for 1960. And the major contract—a $16.8-million one for driving and lining the tunnel and construction of immediate approaches—has been awarded Edmund Nuttall Son & Co., Ltd., London.

County councils of Essex and Kent each will contribute $700,000 toward construction of the project. The Ministry of Transport will make a grant of $7.4 million. The balance of some $21 million will come from central funds provided for new roads and will be repaid from toll charges.

• **A 3½-mi link**—The 4,700-ft-long facility and its approaches will make a 3½-mi north-south link between the London-Tilbury road and the London-Rochester road. However, Parliamentary approval may be sought to extend the northern approaches to the Barking-Southend road and to carry the approach over the London-Tilbury road by viaduct.

The two-lane tunnel, expected to handle 2,000,000 vehicles a year, will be 100 ft below highwater level at its lowest points. The approaches, twin two-lane roadways, will form a link between north and south orbital roads

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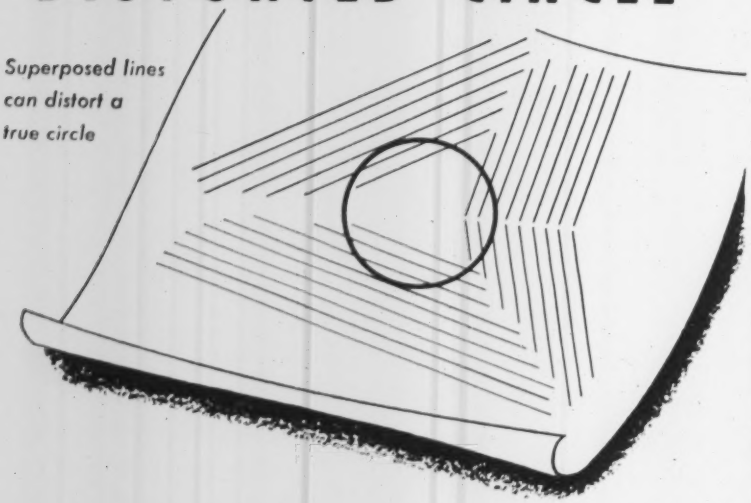
The Strange Case of the DISTORTED CIRCLE

Superposed lines can distort a true circle



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that have been planned for future construction about 15 miles from central London.

The tunnel will be circular, castiron lined, and have a diameter of 28 ft 2 in. inside the lining. Its roadway will be 21 ft wide between curbs and will be carried on a reinforced concrete structure. The minimum vertical headroom above the roadway will be 16 ft at the curb.

The tunnel will be driven entirely in water-bearing ground, consisting of silt and gravel deposited by the river and underlying chalk. In order to keep out groundwater during construction, tunneling operations will be carried out under compressed air. Air-compressing machinery already has been installed at the working shafts on each side of the river. The main plant consists of two sets of three compressors, each with a capacity of 5,000 cu ft of air per minute and driven by 750 hp motors.

• **Shield tunneling**—Tunneling will be done with the aid of shields, each weighing nearly 300 tons and able to exert a total thrust of over 6,000 tons. A series of 42 hydraulic rams mounted peripherally inside the shield are designed to operate at a maximum pressure of 6,000 psi. Secondary hydraulic rams, operating at a lower working pressure, will be used to support the tunnel face.

Before the war, two of the shields for the main tunnel were erected in shield chambers. The chambers, constructed at the Essex and Kent working sites at the time the pilot tunnel was driven, are short lengths of tunnel with a 35-ft internal diameter. They are built on the line of the main tunnel and will become an integral part of it.

The two shields already erected will be driven under the river until they meet to complete a 2,800-ft tunnel section.

After the first shield has been moved away from the chamber on the Kent side, another shield will be erected in the same chamber and driven toward land and the tunnel entrance. This landward shield will be driven up to a caisson containing ventilation shafts, which will be sunk into the mud of the Thames marsh within about 300 ft of the tunnel portal. Here the shield will be dismantled and the remaining short length of tunnel will be constructed in open excavation.

A similar process will take place on the Essex side. There, however, the landward drive is relatively short, so it is possible that a shield will not be used.

(*Continued on page 90*)

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the product and the place

In West Africa the farmer protects his grain in caches atop poles. He knows local conditions!

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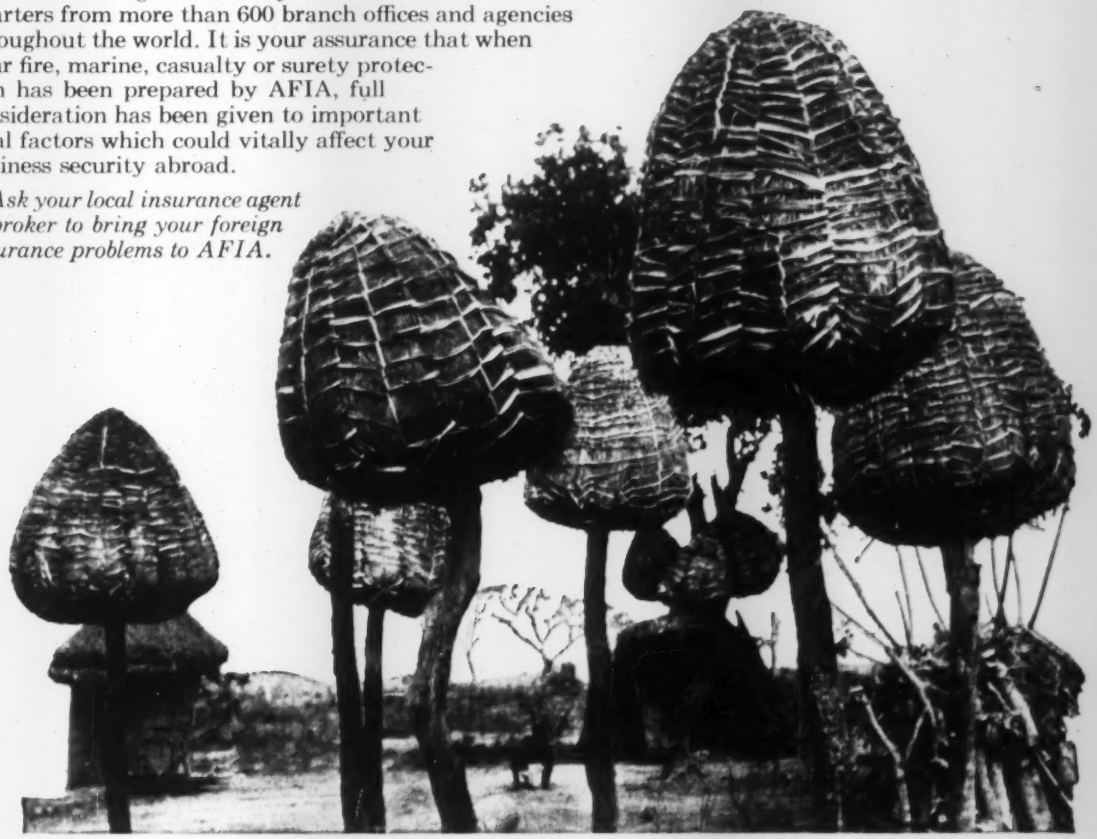

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ENGINEERING REPORTS:

PLEASANT, ATTRACTIVE non-glare tunnel lighting is supplied by G-E fluorescent lamps providing continuous lines of light. Varying-intensity system supplies more or less light as needed at portals to avoid light-blindness. System also allows quick relamping.

DRIVER SAFETY and comfort are promoted, yet power conserved by variable light levels achieved with G-E saturable reactors.

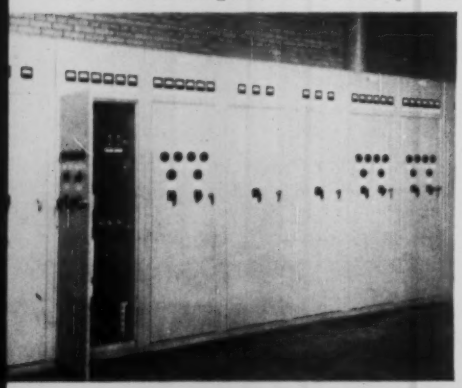
GENERAL ELECTRIC SYSTEMS . . .

Help assure traffic safety

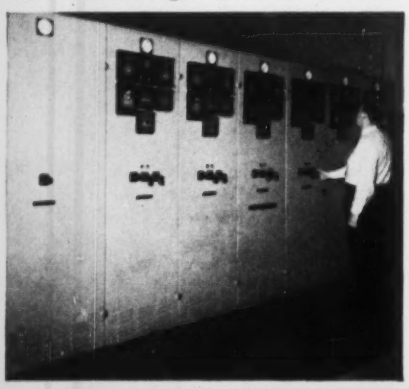
RELIABILITY AND SAFETY AT LOW COST describe the main requirements of a vehicular tunnel's electrical system. And to overcome any psychological aversion to tunnel travel, these systems must provide lighting designed to give an attractive, inviting impression. General Electric, long the largest supplier of electric equipment for tunnels, has had much experience providing such desirable systems. G-E systems have proved themselves at many of the major tunnels throughout the nation.

Feature of G-E system is continuous-line-of-light, variable-intensity lighting.* Intermittent shadow and glare areas are practically eliminated and tunnel is given cheerful appearance. Eye adaptation, day or night, at entrances is eased by adjustable light levels at portals.

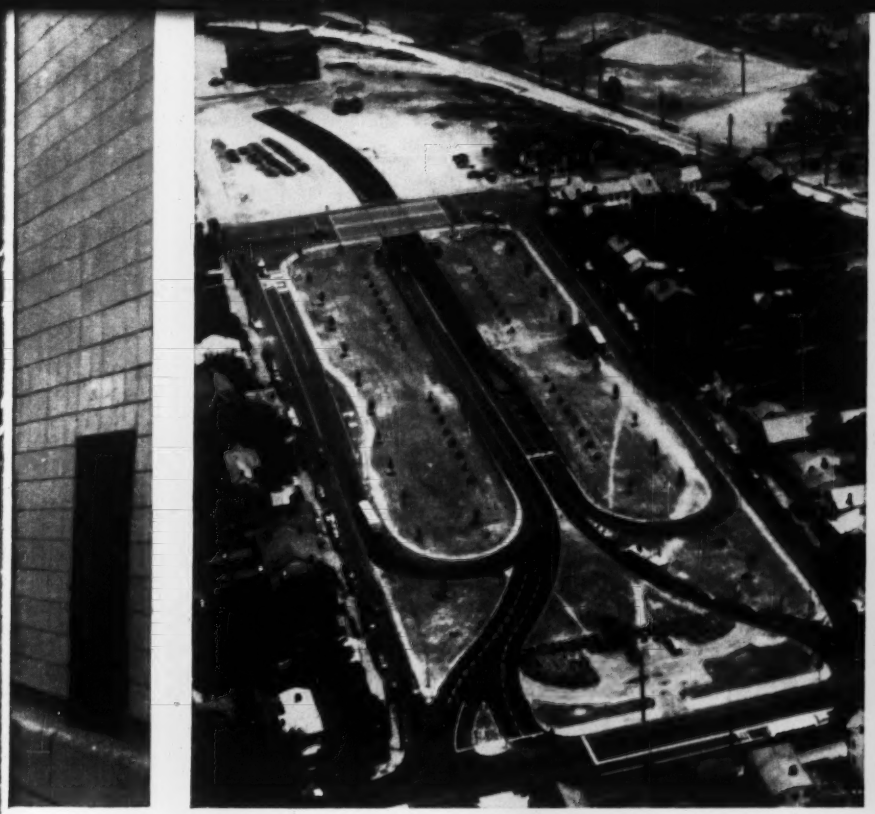
INTEGRATED CONTROL of light levels for varying-intensity system is accomplished with custom-designed, G-E control panels.



VITAL CONTINUITY of power system is provided for by highly dependable G-E metal-clad switchgear at service entrance.



ECONOMICAL G-E unit substations supply power close to load, protect and control tunnel feeder circuits.



NORFOLK-PORTSMOUTH Tunnel in Virginia is one of several major tunnels in the U.S. that features a G-E electrical system. Built under the Elizabeth River, the tunnel is 3350 feet long and has clover-leaf approaches (above).

SQUIRREL HILL Tunnel on Penn-Lincoln Parkway, Pittsburgh, also incorporates major G-E equipment in vital light and power system.

BROOKLYN-BATTERY Tunnel in New York City, also equipped by G.E., is longest in U.S. (9117 ft). G-E luminaires such as those shown here help assure safe, well-lighted approaches.

and make tunnels more attractive

VALUABLE ENGINEERING SERVICES are also available to you with G-E equipment for tunnels. Application engineers, who are experienced specialists in tunnel systems, assist consultants and equipment manufacturers in system design and equipment selection. Field service engineers help contractors expedite installation, start-up. Nationwide service shops mean maintenance and repair facilities are never far away. Project co-ordination helps assure integrated on-time engineering, shipment, and installation, of your equipment.

Bring your electrification problems to G.E. Whether your next project is a tunnel or any other heavy construction activity, contact your G-E Apparatus Sales Representative early in the planning stages so he may put G-E equipment and services to work for you. General Electric Company, Section 664-40, Schenectady, N. Y.

*System first developed by consulting engineers L. Geenens and O. Singstad.
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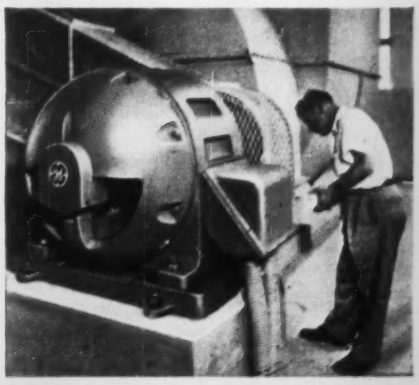
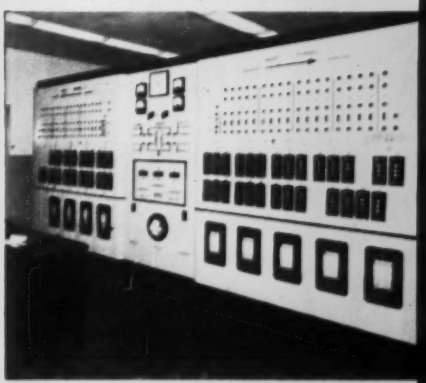
GENERAL ELECTRIC

FACTORY-ENGINEERED, Cabinetrol† panels provide accurate, co-ordinated control of tunnel fan motors.

STURDY G-E Tri-Clad† induction motors drive ventilation fans. Multi-speed feature saves power during off-peak traffic periods.



CENTRALIZED control of tunnel system and services is offered by compact, fully co-ordinated G-E duplex switchboards.



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As under-river drives of the main shields progress, the pilot tunnel will be dismantled. The pilot tunnel, which has an internal diameter of 12 ft, is situated inside the limits to be occupied by the lining of the main tunnel. Thus, excavation of the main tunnel will be an enlargement of the excavation already made for the pilot tunnel.

• **Ventilation system**—The tunnel will be ventilated by means of blower and exhaust fans located in two ventilation buildings to be constructed a short distance from the tunnel portals. Each ventilation station will be connected with the tunnel by two 14-ft-dia shafts that will carry fresh and exhaust air.

Space under the tunnel roadways will be used as a main duct for supplying fresh air—some 600,000 cu ft of it a minute during peak traffic hours. The fresh air will be delivered to the roadway area through a series of small ducts behind the curbs. Contaminated air will be drawn through shafts connected to the tunnel ceiling and discharged from exhaust towers of the ventilation stations.

U. S. Aid Program Helps Carry Out Spanish Road Plan

Execution of a second five-year road plan for Spain is being made much easier for 1956 by the availability of road building machinery and other help under the terms of the U. S.-aid program.

Estimated at $2.5 million, the new plan intends to concentrate on trunk roads, with a total length of 6,600 miles, radiating from Madrid, that carry 80% of the country's road traffic. Local roads will also be repaired.

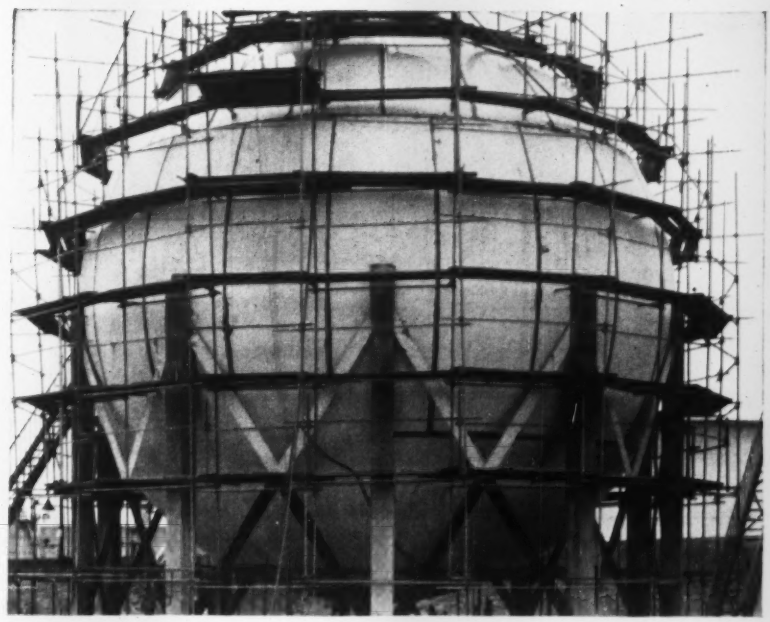
World Bank Loan Backs Honduras Highway Program

Honduras has announced plans to set up and begin operations for a highway maintenance organization to be financed by a World Bank loan estimated at $4.2 million. The loan will also make possible preliminary studies for the improvement and new construction of various sections of two important trunk roads in Honduras, the Northern and Western Highways.

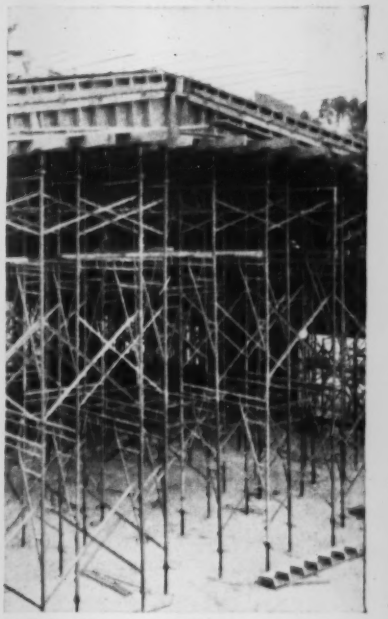
Only 20 mi of the republic's 1,600 mi of road are paved. The basic network consists of five trunk highways—all in need of improvement, and in some cases relocation, to make possible first class paved highways.

(Continued on page 96)

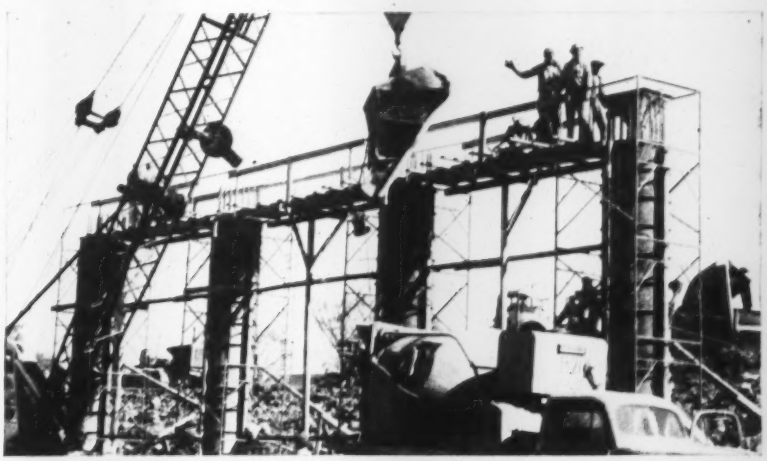
Scaffolding Methods . . . by Patent Scaffolding Co.



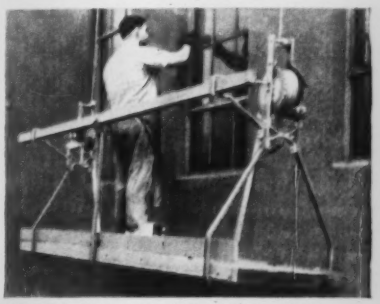
ODD SHAPES—The ability to conform to odd shapes, curved forms, uneven terrain and surfaces makes "TubeLox"® Scaffolding valuable on difficult, hard-to-get-at jobs. Interlocking 2" or 2½" o.d. steel tubes and couplers speeded erection and dismantling of the scaffold for maintenance work on this Union Oil Co. sphere at Wilmington, Calif. Notice how the "TubeLox" Scaffolding is set back to conform exactly to the shape of the sphere permitting workers to get closer to the job.



HEAVY LOAD—"Trouble Saver" Sectional Shoring frames, on 2'6" centers, speed work on Mess Hall, Marine Corps Base, El Toro, Calif. Heavy, high-arched 62' beam varied from 2'2" to 3'6" deep by 1'6" wide. Allison Honer Co., gen. contr.



SMART ENGINEERING—Accurate positioning of prefabricated "Trouble Saver"® Sectional Scaffolding saves time and money on construction of four pier columns for one of 5 overpasses leading to a lower section of the New York State Thruway. Scaffolding supports vibrating machine and workers, and helped in erection of formwork for above-ground sections of pier shells. Carlo Bianchi, contractor.



MEDIUM-DUTY REPAIRS—Exterior work, such as painting or repairs is quickly done with the "Gold Medal"® Junior Scaffold. Mechanical winch with 5/16" steel cable (100 to 200 ft. drops) assures maximum safety. U.L. approved.

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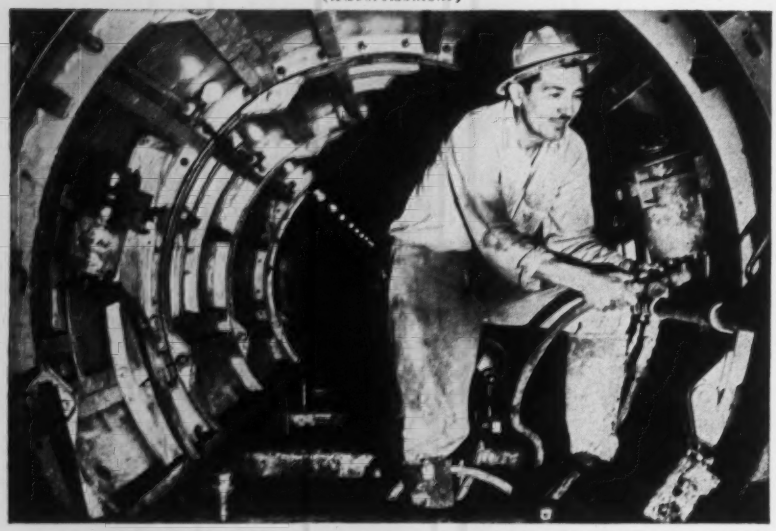


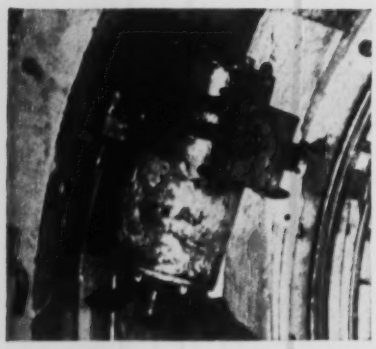
WORKER OPERATES one of the two Viber external form vibrators used on 2.9 mile sewer tunnel job. Vibrators are clamped to form and moved forward as concrete slope advances.

Two Movable External Vibrators Consolidate Concrete in La Cienega And San Fernando Relief Sewer

● **Major problem** of congested sewers in Los Angeles' heavily populated San Fernando Valley is being alleviated by a 2.9 mile long sewer tunnel bored through the Hollywood Hills.

The La Cienega and San Fernando relief sewer tunnel was holed through in horseshoe shape with a minimum diameter of 7 ft. 9 in. During lining, it was made circular with a 6 ft. diameter. Kemper Construction Company, Los Angeles, headed lining operations.

The Kemper crew prepared approximately 135 cu. yd. of concrete daily at a batch plant at the tunnel's entrance and hauled it by 24 gauge train to work site.



VIBER MODEL PX high speed pneumatic vibrator shown mounted on form in sewer tunnel. Model PX is used widely in tunnel lining operations.

Once concrete was discharged on top of T-Lock lining forms and flow commenced around full-circle forms, two external Viber Model PX high speed pneumatic vibrators were used to consolidate it rapidly and completely. Vibrators were clamped to the form and moved forward as concrete slope advanced. A Viber internal vibrator was sometimes used in conjunction with the external vibrators.

Highly experienced in tunnel lining, Kemper Construction Company designed the vibrator mounting clamp to fit the needs of this job. Clamp hangs from angle rail which extends length of form section. As slope advances, clamp may be released to switch vibrator to new position along rail without lifting it from rail.

Viber Model PX vibrators are used widely in tunnel lining operations. They are also used effectively in manufacturing concrete pipe and other precast members wherever reusable steel forms are set up on a production basis.

For further information on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 7-B, 726 South Flower Street, Burbank, Calif.

VIBER

CONCRETE VIBRATORS SINCE 1931

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In spite of the fact that many roads and trails are passable only in dry weather, the number of motor vehicles in Honduras has doubled since 1950, with 7,000 in operation last year.

The Honduras highway department lacks, at the present time, road equipment, adequate offices, warehouses and workshop facilities.

Peak Project

Mountaintop hotel will be reached by cableway

Contract has been awarded for a $1.8-million, 14-story cylindrical hotel to be erected atop 7,000-ft Mt. Avila, north of Caracas, Venezuela. Part of a $9-million recreational project on top of the mountain, the building is now scheduled for completion by November 15.

Overlooking the Valley of Caracas to the south and the Caribbean coast to the north, the hotel will be reached by an 11,000-ft cableway from the outskirts of Caracas that is already completed and a shorter cableway now under construction from the project's main terminal.

The hotel will be centrally heated and will have a swimming pool, dining room and roof lounge, in addition to its 70 rooms. The separate main terminal, nearing completion, houses an observation area, a restaurant and cafeteria to hold 1,000 persons.

Including the 11,000-ft cableway from Caracas, the terminals and other facilities, over $6 million has already been spent on the project. A third cableway is being built to the highest peak of the mountain.

Foundations are being laid for the towers of still another cableway. Said to be the longest cableway to be built in this hemisphere, it will run nearly five miles down the northern slopes of the mountain to the coast, and will include two stops at villages along the way.

Operating along the recently opened 11,000-ft cableway from Caracas are fourteen 28-passenger cars that are capable of transporting 800 passengers per hour.

The hotel contract was awarded to Eneca S. A. of Caracas. Construction is in charge of Gustavo Larrazabal of the Ministry of Public Works.

Six hundred workers housed in barracks on top of the mountain are currently engaged. This number will be increased to 1,500 during the final phase of the project.

(*International continued on page 94*)

8 Reasons Why UNI-FORM Panels are the most widely used Prefabricated Form in the Industry

VERSATILITY

Uni-Form Panels will form straight, irregular, curved, battered walls . . . slabs, beams, columns, piers—everything from small house foundations to massive concrete structures.

COMPLETE — READY TO USE

The Uni-Form Panel System is complete, ready to use when it reaches the job. Eliminates field fabrication. Result: FASTER JOB STARTS.

FAST ERECTION

Simple assembly of easy to handle panels increases productivity of labor. Form more contact area per man hour with Uni-Form Panels.

AUTOMATIC ACCURACY

Assembly of Panels with Uni-Form Ties furnished for any wall thickness insures automatically accurate forming. Tie positively locks and spreads panels. No measuring . . . no guesswork.

LUMBER SAVINGS

You use less lumber in Uni-Forming. Steel-framed panels erect into a tight, rigid form requiring minimum alignment and bracing on 1 side only—regardless of height. Saves labor too.

FASTER STRIPPING

Less alignment and bracing lumber . . . fewer parts to remove means faster stripping, lower costs.

LONG LIFE

Rugged steel frame designed for fast pouring, cradles and protects plywood edges . . . permits maximum re-usage of plywood (actually 50 times or more) before replacement is necessary. Minimum panel maintenance required . . . lower material costs.

EXPERT ENGINEERING SERVICE

Universal's engineering staff and field engineers provide competent, specialized assistance, backed by over 40 years of experience in concrete forming.

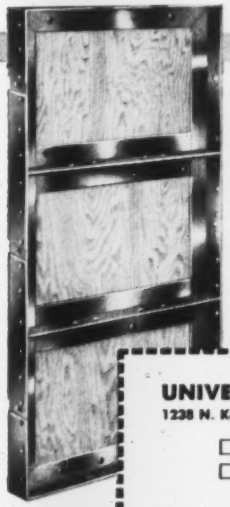
Branch Offices and Warehouses at: Los Angeles • San Leandro, Calif. • Houston, Texas • Cleveland, Ohio • Baltimore, Md. • Atlanta, Ga.

3 SIMPLE STEPS FOR ASSEMBLY

1. Insert Tie loop in Panel tie hole.

2. Tie Key locks Uni-Form Tie to Panel.

3. Tie loop receives adjacent Panel. Insertion of Tie Key completes tieing, locking and spreading operation.



3 BASIC ELEMENTS

UNI-FORM PANEL . . . Heavy duty — steel-framed, plywood faced.

UNI-FORM TIE . . . High strength, easy break-back.

UNI-FORM TIE KEY . . . Wedge shaped for fast, easy insertion and removal. Reusable.

UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue • Chicago, Illinois

☐ Send me complete details on UNI-FORM Panel System.
☐ SHOW ME! I am sending plans under separate cover.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

Superior results

SWITCHED HIM TO

CARTER'S

Squeeze Bottle

INDIA INK

Robert J. Newsham — Chief Product Designer, CONTINENTAL SCREW CO., New Bedford, Mass.

Mr. Newsham's drafting department averages over 6500 blueprints, originals and otherwise, per week.

CARTER'S quotes Mr. Newsham

". . . we tried your drawing ink in the new applicator bottle and found a marked improvement in opaqueness and much less sediment, without doubt the result of your 'electro-polarizing' process.

"Our draftsmen were quite impressed with your new applicator bottle — especially in comparison with the other applicator bottles on the market — because of the cleanliness and ease experienced in its everyday use.

"Because of these advantages, we have changed to Carter's Drawing Ink instead of the former brand which we had used for a number of years."

AMONG THE BIG USERS OF CARTER'S SQUEEZE BOTTLE INDIA INK ARE:
GENERAL ELECTRIC COMPANY
ALLIS-CHALMERS MANUFACTURING COMPANY
WHY DON'T YOU TRY IT?

On sale at leading stationers, art supply stores and blueprint houses.

THE CARTER'S INK COMPANY

Since 1858 the quality name. CARBON PAPERS ■ TYPEWRITER RIBBONS ■ ADHESIVES ■ STAMP PADS & INKS ■ DUPLICATOR SUPPLIES ■ MARKING DEVICES AND INKS ■ ERADICATORS ■ FOUNTAIN PEN INKS ■ RUBBER CEMENT ■ INDELIBLE INKS ■ DRAWING INKS ■ ARTIST COLORS

CAMBRIDGE 42, MASSACHUSETTS

. . . International

Four-Year Highway Program Well Under Way in Ecuador

Six highways are being constructed in Ecuador at an estimated cost of $20 million. Part of the cost is being underwritten by the International Bank for Reconstruction and Development. The project will open up new agricultural areas in Guayas Province and link several new highways with existing roads in adjoining provinces.

The Executive Highway Committee of Guayas, affiliated with the International Road Federation, is in charge of a four-year program which started in mid-1955 and is now well under way. The firm of Michael Baker Jr., Inc., of Rochester, Pa., serves as consulting engineer to the committee.

Cross-Country Expressway Planned for Switzerland

A $350-million east-west express highway plan is being studied in Switzerland. The road would extend from Geneva at the French border to St. Margrethen, bordering West Austria south of Lake Konstanz.

Two north-south links have been planned from Basle and Zurich to Lucerne. These are to be continued later over the St. Gotthard mountain in Switzerland.

Continuous Girder Bridge Incorporates 300-Ft Span

Work on Vancouver's $10-million four-lane Oak Street Bridge has reached the halfway mark. The new structure over the north arm of the Fraser River at Marpole, B. C., is said to have the biggest plate girder of its type in the British Commonwealth.

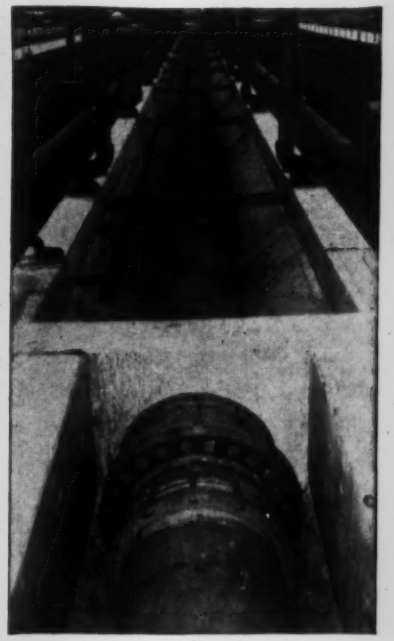
Already completed are the two main piers of the bridge. Main unsupported span is 300 ft. Side spans rest on five piers and are 200 ft each. The long bridge will be erected in plate-girder sections of 50 tons.

Engineers are Phillips, Barratt and partners. Dominion Bridge Co. is fabricating the girders.

To Build Ontario Expressway

The Metropolitan Toronto Council will construct a $28-million Don Valley expressway, authorized by the Ontario Municipal Board.

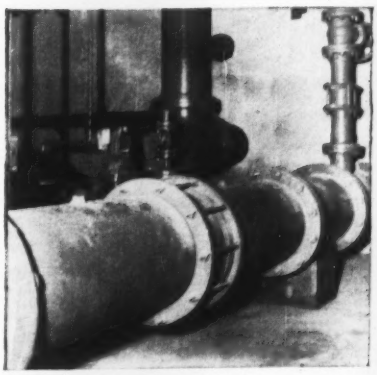
About $8 million of the work will be done this year. The seven-mile expressway will link Highway 401 in suburban North York and the Lake Shore Expressway.



Workmen (left) adjust follower rings before inserting bolts on a 30-inch Style 38 Dresser Coupling. It's the air line leading to the main settling tank in Miami's Virginia Key Sewage Disposal Plant. Steel and cast iron pipe meet in a Style 62 Dresser Reducing Coupling on aeration tank air line (above).

Quick-change Act for Miami Disposal Plant

Steel pipe and Dresser Couplings provide easy access, system flexibility



Dismantling for maintenance looks and is easy with a Dresser Style 38 Coupling. This one joins a low flushing water line in chlorinator building. Another Style 38 is on the vertical line at upper right.

Miami Sewer Project Associates designed the new Virginia Key Sewage Disposal Plant at Miami, Florida, for high reliability and convenient modification.

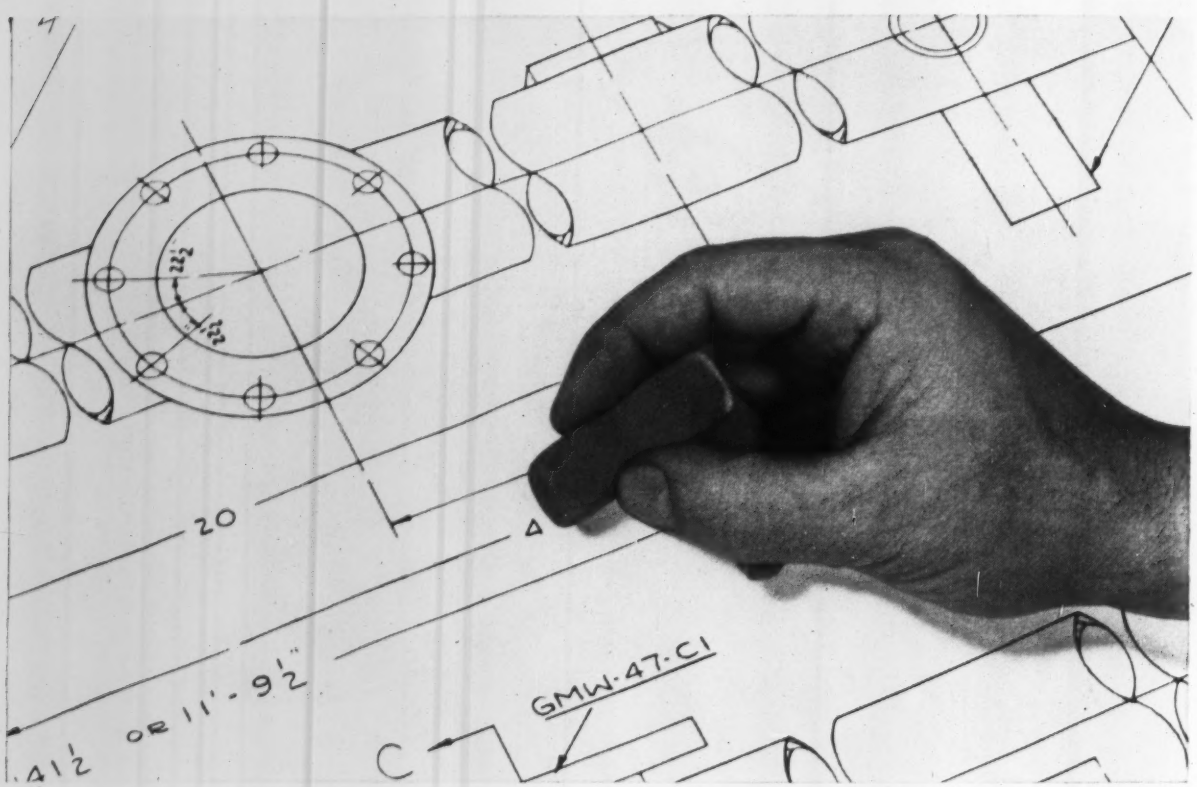
They sought easy dismantling of permanent aeration lines so maintenance and repair of equipment could be performed quickly. They also wanted an easy way to dismount and set up dewatering lines in new positions as required.

Dresser Couplings were chosen as the ideal answer to this common disposal plant piping problem. They went in quickly, easily and accurately — five precision-made parts, plus required bolts, reduce all pipe joining to a simple mechanical operation. Installations require only a wrench . . . average joining time, two man-minutes per bolt. And they're easy to install in tight places.

Dresser Couplings are a "must" for dismantling purposes. Removal is as easy as assembly . . . and all coupling parts may be re-used in the new piping setup. And, most important in any sewage disposal project, they remove strains on pumps and valves.

Proved in use for more than 60 years, no pipe joining method provides all the Dresser advantages . . . 100% tight, permanent, flexible, simple, fast and economical. Send for complete information about Dresser applications on water, sewage, and industrial waste projects. Write Dresser Manufacturing Division, Bradford, Pa. Sales offices in: New York, Philadelphia, Chicago, S. San Francisco, Houston, Denver, Toronto, Calgary.

ONE OF THE DRESSER INDUSTRIES



Photographic lines on a Kodagraph Autopositive Paper Translucent intermediate can be quickly removed with ordinary eraser.

To simplify design changes

How can you make changes in a drawing—but still keep the original design intact—without costly retracing? In thousands of drafting rooms they follow this short cut: *Reproduce the drawing on Kodagraph Autopositive Paper Translucent.*

This gives you a positive photographic intermediate *directly*, without a negative step or darkroom processing. Remove the unwanted detail from this print with a moistened pencil eraser. Add the new design with pencil or ink—and presto! *You have a new print-making master* on high-quality vellum-type paper, which will turn out sharp, legible blueprints or direct-process prints at fast machine speeds.

This is just another example of the way you'll save with low-cost Kodagraph Materials, which you, or your local blueprinter, can process quickly.

EASTMAN KODAK COMPANY
Graphic Reproduction Division, Rochester 4, N. Y.

New booklet is jam-packed with valuable tips on saving drafting time, protecting drawings, getting better prints.

Kodagraph Reproduction Materials

MAIL COUPON FOR FREE BOOKLET

EASTMAN KODAK COMPANY 67
Graphic Reproduction Division, Rochester 4, N. Y.

Gentlemen: Please send me a free copy of your new booklet on Kodagraph Reproduction Materials.

Name_____ Position_____

Company_____

Street_____

City_____ Zone_____ State_____

Kodak
TRADEMARK

Kennison Retires

Chief engineer of New York City's water board built outstanding career

Karl R. Kennison, one of the nation's most prominent engineers in the field of water supply, will retire June 1 from his post as chief engineer of the New York City Board of Water Supply.

Kennison, who celebrates his 70th birthday this month, is retiring at his own request to devote more time to personal interests. He has been chief engineer of the board since 1952, but his association with New York water supply problems goes back much further. From 1939-1952 he was on a board of consultants of the New York Board of water supply.

An "upland source man," Kennison believes that when it comes to water supply a city should give its attention primarily to finding the best source of water supply rather than finding the cheapest source.

One of the highlights in a large and varied career was his role as a chief witness for New York City in its Delaware water case decided by the U. S. Supreme Court in 1954.

As chief engineer of the BWS he supervised the design and construction of extension of water supply sources to the Delaware River including the Neversink Reservoir and Tunnel, Pepacton Reservoir, the East Delaware Tunnel, and most recently the West Delaware Tunnel.

Prior to becoming chief engineer of the BWS, he served in a similar capacity in the Metropolitan District Water Supply Commission of Massachusetts and of the construction Division of the Metropolitan District Commission from 1939-1950. A man of known integrity, he resigned from this post because of "poilitics and inefficiency" (ENR Sept. 14, '50, p. 30).

While with the Massachusetts commission he had charge of the construction of the Quabbin Reservoir on the Swift River, the Ware River intake works and the Quabbin, Chicopee, Hultman reservoirs.

• Advises young water engineers—Keenly aware of the shortage of engineering personnel, Kennison believes that to add to the problem, young engineers when looking for work are more concerned with job security and high pay, rather in finding interesting work and learning as much as they can. It is his belief that the more you know the better paid you will be.

K. R. Kennison

Also he stated, that today young engineers tend to need too much supervision instead of using their own resources to solve the problem at hand.

Kennison, who has held many government and private posts in his 48 years in the water supply field, was born in Marysville, N. B. in 1886. He graduated from Colby College with an A.B. degree in 1906, from here he went to MIT and received his B.S. in mechanical engineering in 1908.

Leaving Colby College in 1910, where he was an instructor in mathematics, he became the principal assistant in the consulting engineering office of John R. Freeman in Providence, R. I. One of the many projects he worked on in Freeman's office was a hydraulic structure study on the repair of the Grand Canal of China.

In 1915 he became an engineer in the design division of the Providence Water Supply Board. When the U. S. entered World War I, Kennison became a supervising engineer in the U. S. Navy's destroyer construction program. With the end of the war in 1918, he took the job as assistant district plant engineer in the U. S. Shipping Board doing plant construction in the Middle Atlantic and Southern States.

(Continued on page 98)

RUBBING CEILINGS?

Do it GIRAFFE with a CEILING GRINDER

- **FASTER AND EASIER:** One man will average almost 4000 sq. ft. per day. Does not need scaffolding.
- **CHEAPER AND BETTER:** Money saved on finishing will help pay for grinding.
- **DEPENDABLE:** Individual GIRAFFES have worked more than 1,000,000 square feet without major overhaul.

GIRAFFE (R)

Heights up to 24 ft.

Has been adapted to cleaning ceilings.

CONCRETE GRINDING CORP.
300 STRAIGHT ST. PATERSON, N. J.

Don't build an obstacle course

get wide-open

spaces—with

Butler buildings

Why pay for building space you can't use? Poles, posts, columns, roof trusses—all these rob you of usable space. But there's no waste in Butler buildings.

Rigid frames span the entire width of Butler buildings. There are no posts to eat up storage space. No obstructions to get in the way of men or machines . . . nothing to interfere with the smooth flow of freight or the efficient arrangement of offices, assembly lines, cafeterias. Truss-free interiors permit storage right up into the roof peak, placement of lights, sprinkler systems, and other fixtures completely out of the way of floor traffic. For the whole story on Butler metal buildings, ask your Butler Builder.

Consult the yellow pages of your telephone directory for name of your Butler Builder, or write on your company letterhead for informative brochure.

BUTLER STEEL PRODUCTS

BUTLER MANUFACTURING COMPANY

7418 East 13th Street, Kansas City 26, Missouri

Manufacturers of Steel Buildings • Oil Equipment
Farm Equipment • Dry Cleaners Equipment
Outdoor Advertising Equipment • Special Products

Sales Offices in Los Angeles, Richmond, Calif. Houston, Tex. • Birmingham, Ala. • Minneapolis, Minn. Chicago, Ill. • Detroit, Mich. • New York, N. Y. Burlington, Ont., Can.

. . . Men and Jobs

From 1920-1952 he had his own consulting engineering office in Boston, Mass. Here he did studies of water supply needs and resources for many U. S. cities and foreign countries.

He joined the Metropolitan District Water Supply Commission in 1926 as designing engineer and deputy chief engineer. In this capacity he not only worked on the water supply problems of Boston but for 20 or more other municipalities as well. In 1939 he became chief engineer.

Known for his invention of the Kennison Nozzle, which is used throughout the world for measurement of sewage flow, Kennison has received many awards for his achievements in sanitary engineering.

Some of the most notable awards are: the George Warren Fuller Award of the American Water Works Assn. for 1951 and the Institution Award presented by the Institute of Water Engineers of England for the years 1946 and 1956.

He is a past president of the Northeastern Section of the ASCE and of the New England Water Works Assn.

Technical Service Head Moves to Newly Created Post

George W. Howard has been promoted to fill the newly created position of technical director at the Corps of Engineers' Research and Development Laboratories, Fort Belvoir, Va. He will serve as assistant to the director, Col. H. F. Sykes, Jr., in guiding the extensive program of basic and applied research, engineering design and development, and testing Corps equipment conducted at the 1,600-man installation.

Chief of the laboratories' Technical Service Department prior to his promotion, Howard began his career with the Army Engineers more than 23 years ago, and has been associated with the laboratories since 1941, both as a civilian and an officer.

G. W. Howard

Men and Jobs Briefs . . .

• **Associations**—The Western Concrete Pipe Assn. re-elects as president, **Harold W. Chutter** of the Jourdan Concrete Pipe Company of Fresno, Calif. . . . **Thomas Walsh**, Jr. of the Walsh Construction Company, New York, is elected president of The Moles . . . **John F. Hennessy** of the engineering firm of Syska & Hennessy is named president of the New York Building Congress.

• **Corps of Engineers**—The present post engineer at Fort Ord, Calif., **Col. Henry E. Helmboldt** will assume duty as resident engineer at Childersburg, Alabama, Mobile Engineer District.

• **Careers**—The General State Authority of Pennsylvania appoints **Conrad F. Shindel**, former supervisor of construction for RCA Victor Radio Brazil in South America, as supervising construction engineer of the authority . . . **F. R. Fredrickson**, former resident engineer for Allegheny County Sanitary Authority of Pennsylvania, is appointed division engineer of the authority.

• **Business**—The construction firm of Hillyer & Lovan, Inc., of Jacksonville, Fla., which was purchased by **William E. Arnold** a few years ago, will change its name to the William E. Arnold Co. . . . Moore and Glass Inc., Cleveland, Ohio, engineers and subcontractors for structural framing systems and specialty building products opens an Akron, Ohio, branch office under the charge of **Alvin E. Shetler.**

• **Education**—Now serving as Dean of Students at Carnegie Institute of Technology, **John W. Graham** is appointed vice president of The Cooper Union for the Advancement of Science and Art in New York City. The appointment becomes effective July 1 of this year.

• **Retirements—Charles F. Weeber**, an important figure in the construction of military bases throughout the Pacific in World War II, gives up his position as financial vice president of the Hawaiian Dredging Co. . . . **Thomas W. Reeves**, division engineer, after 30 years of service with the Engineering & Construction and the Harbor & Bridges Divisions of the City of Toledo, Ohio.

35% INCREASE in CEMENT and AGGREGATE PRODUCTION NEEDED

Are You Preparing to Meet the Demand?

Current cement production in the United States runs about 265 million barrels per year. Carefully calculated estimates place required capacity for 1959 at 407 million barrels to supply highway and other construction growth. The increase in aggregate consumption will be equally great throughout this same period.

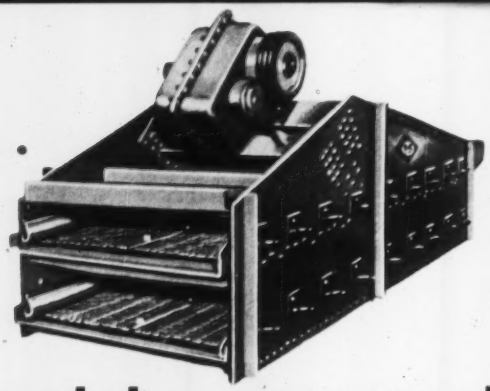
Yes, ahead of you is what could be most profitable years — profitable if your plant is ready to handle increased volume efficiently — profitable if your plant is geared to meet rigid specifications economically.

ALLIS-CHALMERS CAN HELP YOU

ALLIS-CHALMERS

A-4818

ALLIS-CHALMERS OFFERS Experienced Help . . .



and the most complete

Integrated

for aggregate and

VALUABLE INFORMATION AVAILABLE

In planning for profitable expansion, there are two all-important considerations:

1. Dollar per ton (or barrel) cost of expansion.
2. Volume per man-hour.

With these factors dictating the approach, expansion planning differs from plant to plant. In some operations, profitably meeting increased capacity requirements calls for complete replacement of outmoded equipment. In other plants, the answer lies in supplementing existing equipment and/or developing a more efficient flow. Considerations might also run toward reduced fuel utilization, power consumption, and maintenance. In the case of cement, it could also call for more grinding production or increased burning capacity. It could require better heat recovery or faster clinker cooling.

How Can Allis-Chalmers Help?

With 108 years experience in producing hundreds of *different* types of processing machinery—with the knowledge gained in solving tens of thousands of varied application problems, Allis-Chalmers is an organization that can help you avoid many "pitfalls" in your expansion effort.

Allis-Chalmers, with a century of leadership and experience, builds all the basic machines used in producing aggregate and in making cement, as well as the motors and electric power equipment needed to drive them.

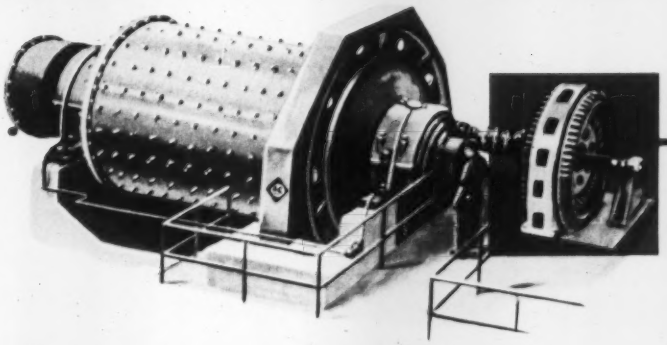
Gyratory Crushers — Most Allis-Chalmers gyratory crushers are supplied with hydraulic adjustment which provides precise product size control and compensation for wear — at the flick of a finger. A wide line of jaw crushers are also built by Allis-Chalmers.

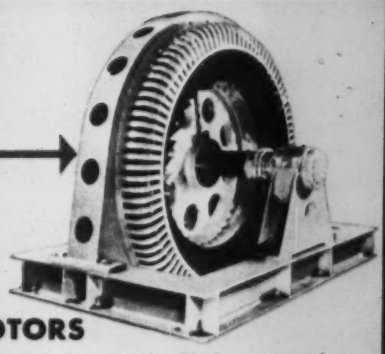
Vibrating Screens — Regardless of screening problems there's an Allis-Chalmers screen designed to meet your specific need. Applications include scalping, medium and fine

Over Half of All the Cement Manufactured in U. S. is Processed in Allis-Chalmers Equipment

A-C ALLIS CHALMERS

ALLIS-





MOTORS

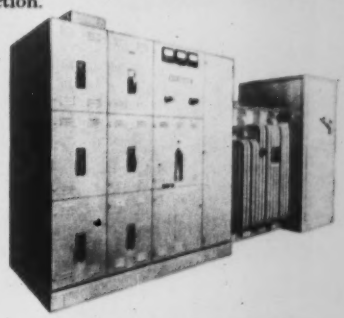
Illustrated is an Allis-Chalmers synchronous motor. Motors of this type are applicable to most constant speed drives. Widely used on grinding mills, Allis-Chalmers synchronous motors provide high efficiency and improve system power factor.

Allis-Chalmers builds a complete line of poly phase induction, synchronous and direct current motors. Mechanical modifications obtainable include drip-proof, splash-proof and totally-enclosed fan-cooled construction in vertical as well as horizontal types. Many ratings are available with flange-type construction.

and diversified line of

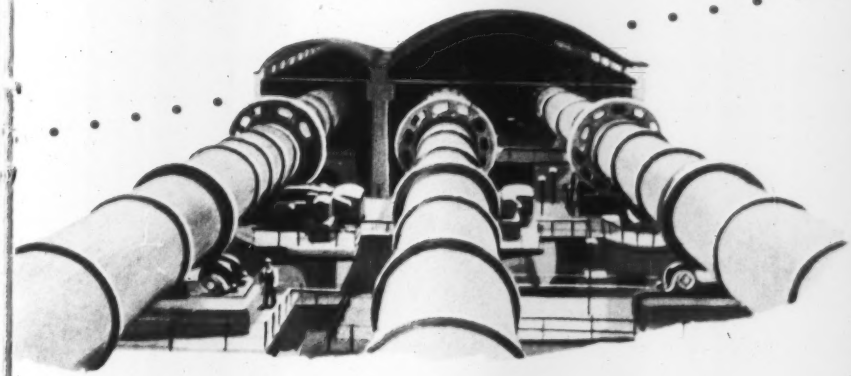
Equipment

cement industries



UNIT SUBSTATIONS

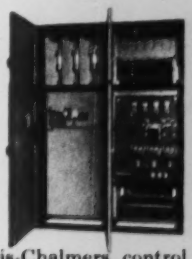
Available in combinations of switchgear and transformer elements to meet any requirement. With unit located near load centers, high voltages are brought in with a minimum of power loss and with complete safety. Because secondary runs of heavy cable are short, voltage drop is reduced.



separation, wet or dry screening, rinsing and dewatering. The recently introduced general purpose Model AVS screen is the "talk" of the industry.

Grinding Mills — Allis-Chalmers manufactures all the proven mill designs including those for producing specification or manufactured sand.

Rotary Kilns — Allis-Chalmers all-welded rotary kilns are built in standard and special sizes for a wide variety of uses including cement manufacturing and the production of lightweight aggregates, lime, refractory materials, fertilizers, and chemicals.



CONTROL

The development of the control circuit of the starter shown is an example of Allis-Chalmers integration. Drawing on experience gained in applying hundreds of gyratory crushers, Allis-Chalmers control and crushing engineers worked out this circuit specifically to cut costly crusher downtime.

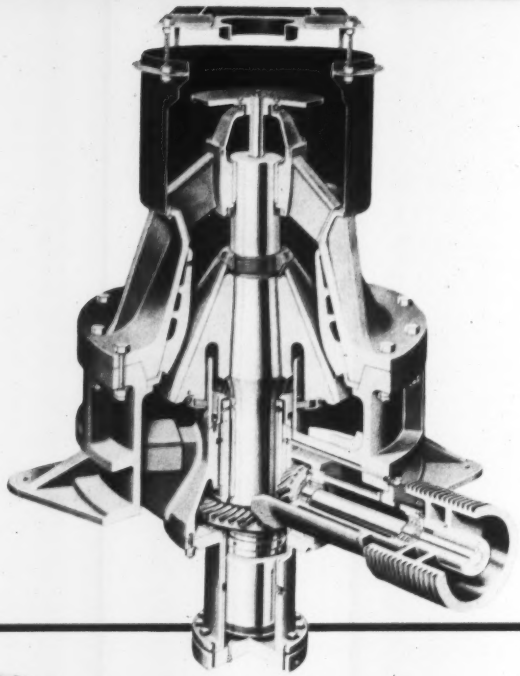
The Allis-Chalmers control line extends from small manual starters for fractional hp motors through starters applied in controlling motors up to 2500 hp. Built into every control is the type and degree of protection required to meet a specific need.

CHALMERS

TURN PAGE for help in meeting specifications in stone or sand

SPECIFICATION STONE

at the Flip of the Switch with the HYDROCONE Crusher



One man, one minute product control! In this truly modern crusher, *Hydroset* control provides a rapid and convenient means of raising and lowering the hydraulically supported crushing mantle. Adjustment to precise size is accomplished by the flip of a switch. Compensation for wear and fast emergency unloading are accomplished in the same easy manner.

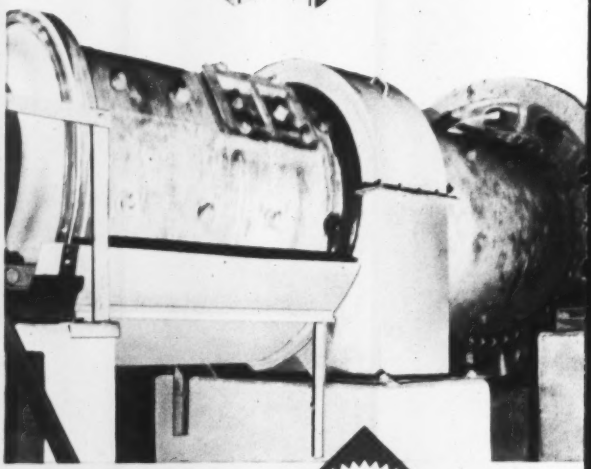
Produces Cubical Product

Because of its small eccentric throw in relation to crusher setting, the *Hydrocone* crusher also helps you meet specification by producing a uniform, cubical product. With a smaller effective ratio of reduction during each crushing stroke, fines, slivers and flats are kept to a minimum.

Hydrocone and Hydroset are Allis Chalmers trademarks.

"Manufactured" SAND

from ALLIS-CHALMERS Rod Mills



An Allis-Chalmers rod mill converts unsalable material into specification sand. It prolongs productivity of natural reserves. It produces sand where natural sands are unavailable or unusable.

Processing specification sand or coarse aggregate from rock, and grinding aggregate or natural sand, are particularly abrasive and difficult jobs. That's why Allis-Chalmers rod mills are so well suited for the job. Basically, the A-C rod mill is a simple, rugged machine . . . a grinding mill that requires little attention, yet provides continuous, dependable performance.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

WRITE FOR LITERATURE

I would like bulletins on .....
(type of equipment)

Explanation of process or problem .....

Name .....

Title ..... Company .....

Address .....

City ..... Zone ..... State .....

A-4818

ALLIS-CHALMERS
Industrial Equipment Division
Milwaukee 1, Wisconsin

Research

Weather Meeting

Changing the weather is discussed by world group

• Rainmaking works—silver iodide seeding in Australia increased rainfall 30% over normal;

• It's expensive—taking up to a ton of silver iodide per cubic mile of cloud seeded;

• It's exacting—with the airplane the logical tool to penetrate water-bearing clouds at the precise temperature zone to trigger rainfall, rather than relying on ground generators to vaporize silver iodide aloft by saturation;

• It needs much research—with some uniform-size solution perhaps the answer to correcting present partial failures;

• And some substitute must be found for silver iodide which decays in sunlight and loses its effectiveness—the solution is perhaps a copper sulfide vapor which seems just as effective without loss of strength.

These are some of the conclusions from the conference on the "Scientific Basis of Weather Modification Studies" at Tucson, Ariz., sponsored by the Institute of Atmospheric Physics headquartered at the University of Arizona.

Some 70 world leaders participated—about half the active world executive force now working in weather modification.

Most of the sessions were without controversy. As H. G. Houghton, chairman of the department of meteorology, Massachusetts Institute of Technology, noted:

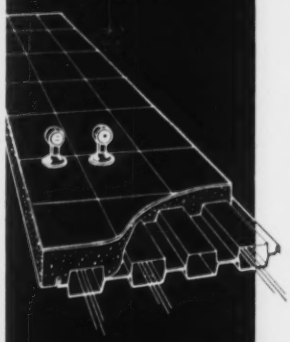
"We're making progress. There no longer are believers and disbelievers."

Along with the glowing forecasts for a weather controllable future—the experts got a word of warning not to get too chummy with the elements.

Man's increasing control over the weather is something to be handled with care, F. W. Reichelderfer, head of the U. S. Weather Bureau, noted.

• **An awesome thought**—He said a properly placed nuclear explosion might put a cloud of dust in the air that would temporarily warm the Arctic and that some of the ice cap might melt. He estimated that if all the Arctic and Antarctic ice caps could be melted, the sea level would be raised between 100 and 200 ft—putting most of the east coast of the U. S. under water. Even a mild atomic melt-

No matter how complex the electrical system, Cellufloor has ample capacity to handle it. Cells, spaced on 6-in. centers, permit the installation of service outlets at any point on the floor.



architects-engineers
Cram & Ferguson, Boston, Mass.

general contractor
Turner Construction Co.,

112-year-old insurance company looks ahead with new functional design

Uses Milcor Cellufloor to get freedom of floor space — and flexibility of electrification

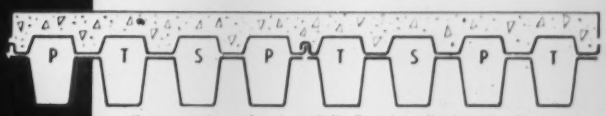
The State Mutual Life Assurance Building in Worcester, Mass. is unique in two respects:

1. It has private offices located in the center of each floor — and general office space in the perimeter. This arrangement provides large expanses of work areas free of all obstructions.
2. The building can't be electrically outdated. Milcor Cellufloor provides power pathways in the floor to accommodate all of today's wiring and permits easy addition of possible new services in the future — data-processing and office automation circuits, closed-circuit TV hook-ups, and many others.

For greater flexibility in placing private-office partitions, the central area of each floor in this building has no columns. Style BC Cellufloor — used throughout — is ideally suited to this type of construction. It combines light weight with great strength — and carries floor loads over long spans with fewer structural supports.

Write for Catalog 270, for planning help.

MILCOR® Cellufloor



Cross-section showing Cellufloor installation in State Mutual Life Assurance Building. P = power, T = telephone, S = signal.

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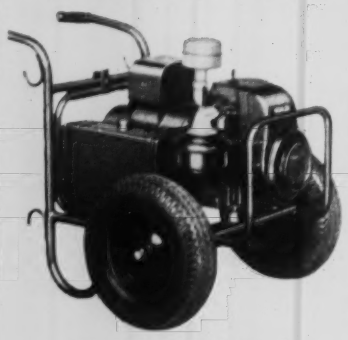

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age resulting in 5 to 10 ft variance could cause enormous damage.

While the symposium realized the significance of controlling rainfall to provide a constance source of water for hydroelectric power and agriculture, it made clear "the conference will deal with the scientific basis of weather modification studies, as contracted with the empirical basis of the commercial basis of such studies."

Results, though, were glowing enough to give some glimmer of optimism for the industrial future.

E. G. Bowen, Australian scientist, said silver iodide cloud seeding in a certain area of Australia showed net precipitation increases of 30%. But silver iodide usage in smoke generators used in the target area burned up to 900 grams per hour. This material was released upwind from the target area in such a way that there can be no question than an adequate amount of silver iodide passed over the target area within supercooled clouds. Bowen said he never had encountered conditions where overseeding was a problem.

Capt. Howard T. Orville, chairman of the president's committee on weather control, claimed findings on rainmaking experiments on the Pacific Coast were accurate and sound. He cited that rainfall in Washington, Oregon, and California test points showed increases from 9 to 17%.

• **A "ludicrous" claim**—These figures were challenged by K. A. Brownlee, professor of statistics at the University of Chicago, who said:

"We are of the opinion the claims are greatly in error and you should completely ignore them. These claims are based on incorrect methods. We, as professional statisticians, regard them as quite ludicrous."

This was the only note of discord in an otherwise harmonious meeting.

Orville said the criticisms of the report were made by statisticians without a meteorological background. "You cannot make a correct analysis purely on a statistical basis," he said.

He said utility companies and lumber interests on the West Coast are continuing their cloud seeding programs, interested principally in increasing the snow pack in the high Sierras which will create additional runoff and more electric power.

He placed the dollar value of additional rainfall attributed to seeding in the three western states at somewhere between $20 and $50 million.

One of the most interesting factors of cloud seeding was the backing given copper sulfide as a seeding agent. The

IMPOSSIBLE WITHOUT EXPLOSIVES

The modern highway—wide and spacious with increased visibility and no cross traffic—is a tribute to modern construction techniques. The above section of U.S. 99 between Bakersfield and Los Angeles, California, is a good example of engineering know-how. Where rock was encountered, blasting crews with Hercules explosives took over.

For more than forty years, Hercules has engaged in continuous research into the development of explosives materials and improved blasting techniques. Whether your requirements are for construction, mining, quarrying, seismic prospecting, or in other fields where explosives are needed, Hercules technical representatives will be glad to assist in the selection of the right materials for the most efficient job.

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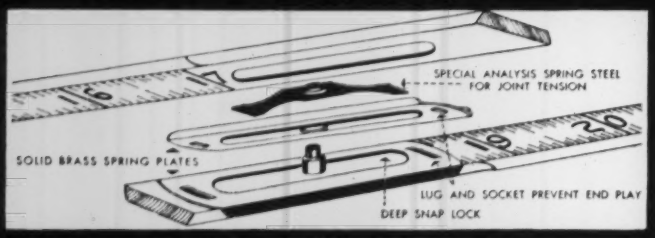
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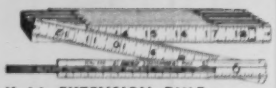

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experiments are being pushed by Raymund Sanger, Federal Institute of Technology, Switzerland. This substance is of more uniform—almost visible—particles and seems immune to the decay detrimental in silver iodide exposure to sunlight.

Evaporation Losses

Molecule-thick covering saves reservoir water

How evaporation losses were cut 45% by covering reservoirs with a molecular thickness of fatty substance has been described by an Australian before a conference arranged by the Southwest Research Institute.

SRI is in San Antonio, Tex., an especially good place for a water evaporation conference: Texans use 8,000,000 acre-ft of water each year; they lose 7,500,000 acre-ft through evaporation.

The Australian scientist, W. W. Mansfield, discussed covering water with a one-ten-millionth-inch chemical film to cut evaporation. He described field tests made within the last two years, tests which showed that a one-molecule thickness of the fatty substance, hexadecanol—common ingredient of cosmetics—can help measurably in cutting evaporation. He found that as little as 2.2 lb will cover 320 acres for six weeks. And the current cost of the chemical is about 50¢ a pound.

Researcher Mansfield was brought to San Antonio by SRI as part of a Southwest Cooperative Research Project on Reservoir Evaporation Control, being financed by water districts and oil and chemical companies of the region.

In practice, the chemical in pellet form has been placed in floating boxes anchored at calculated spacing on a lake. There are gauze windows in the boxes through which the substance spreads.

It was brought out in discussion that 110 different films are being tested in U.S. laboratories. H. G. Hanson of the U. S. Public Health Service made clear that the chemicals would be tested not only for effectiveness as evaporation inhibitors, but also for safety in application to potable waters, public water supplies.

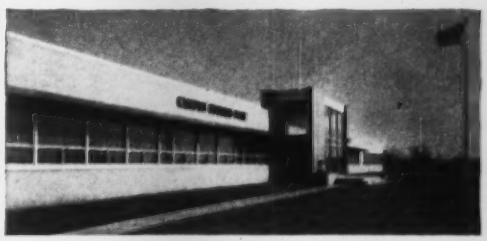
More conventional devices for evaporation control were described by S. W. Freese of the Ft. Worth consulting firm Freese & Nichols. He included: keeping reservoirs deep, eliminating water growths, using windbreaks, storing underground.

Advertising and Circulation Office in the new building of the Camden, N. J., *Courier-Post*, designed by Louis T. Klauder and Associates, Philadelphia, architects. General contractor: Hughes-Foulkrod Co., Philadelphia.

LONGSPANS PROVIDE CLEAR WORK SPACE IN CAMDEN, N. J., NEWSPAPER PLANT

A maximum of unobstructed floor space was the main requirement when the Camden, N. J., *Courier-Post* built a new plant in Delaware Township, outside Camden. The architects provided open space, uncluttered by an excess of supporting columns, in the advertising and circulation departments, city room, composing rooms and shipping and storage areas, by specifying Longspan Joists in the roof structure.

The one-story building, with brick exterior, measures 450 ft by 160 ft. Well over 100 tons of Bethlehem Longspans, 55 ft long, were used in its construction.



The use of Bethlehem Longspans provided other important advantages, too. Building costs were lowered, for the Longspans reached the job-site fully fabricated, clearly marked and ready for instant placing. And installation of overhead lighting and ductwork was greatly simplified, as pipes and conduit were run right through the open webs.

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Fenestra Galvanized-Bonderized Industrial Steel Windows ready to replace the old monitor sash on Caterpillar Tractor Co. Building HH, Peoria, Illinois.

Shown here are A. F. Wiedeman, Caterpillar Construction Engineer, and C. Y. Chapman, Construction Superintendent, examining the Fenestra Bend Bar Test that demonstrates the stronger bond of the Fenestra Galvanized-Bonderized finish. Mr. Chapman, holding the Fenestra test bar, calls it "one of the best galvanizing jobs I've ever seen." Your Fenestra Representative will be glad to show you this same test. It will prove the difference between the Fenestra finish and ordinary galvanizing. Ask to see it, today.

The Fenestra Galvanized-Bonderized finish is also available on the complete line of Fenestra Intermediate Steel Windows for schools, office buildings and other fine structures.

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FACTORY DESIGN NEWS

Caterpillar Tractor Co.,
Peoria, Illinois, chooses Fenestra
Galvanized-Bonderized Industrial Steel
Windows because they estimate they will

SAVE WINDOW PAINTING COSTS FOR 20 YEARS!

Maintaining nearly five miles of monitor windows on the roofs of Caterpillar Building HH and the foundry at Peoria, Illinois, was an expensive and time-consuming problem. With the ordinary sash originally installed in these buildings, a complete paint job was required every four years. Even with this kind of care, the fixed sash in these monitors needed extensive reglazing and rehabilitation a few years ago.

Under the direction of W. H. Zurhorst, Manager, Plant Engineering, a plan was developed by C. Y. Chapman, Construction Superintendent, and A. F. Wiedeman, Construction Engineer, to completely replace the sash with Fenestra® Galvanized-Bonderized Industrial Steel Windows. Based on careful tests they estimate that these windows will require *no maintenance painting for at least 20 years.* The saving in labor and materials will pay for the replacement.

One of the reasons Caterpillar chose Fenestra windows was the Fenestra Galvanized-Bonderized finish. Hot-Dip Galvanizing is recognized as the best protective coating for steel. The zinc surface is actually alloyed with the steel. Fenestra's galvanizing process is completely controlled for a smooth, uniform coating. It's done in Fenestra's specially designed plant. Bonderizing, after galvanizing, gives added protection and an attractive silver-grey finish.

If you are planning a new industrial building or if you are trying to solve an expensive maintenance problem with existing windows, get the facts about Fenestra Galvanized-Bonderized Industrial Steel Windows. Call your local Fenestra Representative—listed in the Yellow Pages—or mail the coupon below.

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COMPARE and you'll specify LIMA for shovels (½ yd. to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

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Sub's Assignment to Bank May Render General Liable

When a subcontractor makes an assignment of money due for the benefit of a creditor, the general contractor is under a liability to conform to the arrangement, if he knows about it and has agreed to it.

Last year, for instance, a sub advised his general by letter that he was assigning all money due it under the contract to a bank, and asked that all checks payable to the sub be made jointly payable to the sub and the bank. The general agreed by letter to the arrangement.

Later, the general made the payments due the sub payable only to the sub, who turned over only a portion of the checks to the bank. The bank sued the general for breach of contract, and the court granted a recovery. On the theory that the bank could enforce the contract as donee beneficiary, the amount of the recovery was the full amount of the checks made payable direct to the sub.

On appeal,[1] the judgment was reduced to the actual amount of damages sustained. Set off against the recovery, was the value of securities deposited by the sub as security for the loan which the bank made.

(1) Wolters Village Management Co. v. Merchants & Planters Nat. Bank, 223 F. 2d 793, U.S. Court of Appeals, May 25, 1955.

Arbitration Clause Is Held Applicable to All Disputes

When a construction contract contains a clause requiring arbitration of disputes stemming from the contract, all disputes must be arbitrated—even a claim that the contract was induced by fraud.

Last year, a subcontractor brought a suit in a federal court in Pennsylvania, claiming he had been induced to enter into a contract through fraud. He sued for damages. The general contractor made an application to the court to restrain the action brought by the subcontractor and to direct that the issues involved be submitted to arbitration as provided in the contract. The court sustained the contention of the general contractor, holding that the sole issue in the case is "who owes whom and how much. . . . Having entered into a solemn written agreement to arbitrate, neither party should be permitted to avoid arbitration by specious charges of fraud or deceit."

This was the wording of the arbitration clause in the contract: "Article XXI. Disputes—Board of Arbitration: In case the Contractor and Sub-Contractor failed to agree in relation to matters of payment, allowance of loss or should either of them dissent from the decision of the Architect (or Engineer), then the matter shall be referred to a Board of Arbitration to consist of one person selected by the Contractor, and one person selected by the Sub-Contractor, these two to select a third. The decision of any two of this Board shall be final and binding on both parties hereto. Each party hereto shall pay one-half the expense of such reference, on written notice of one of the parties hereto to the other."

The general contractor, in its application for a stay of the action brought by the sub-contractor, asked that in the event the court refused the stay, it be granted a judgment against the sub-contractor and its surety for the damages it had sustained by reason of the sub-contractor abandoning the work. The sub-contractor claimed that such action constituted a waiver of the contract provision requiring the arbitration of disputes. The court refused to sustain this contention, stating: "To constitute a 'waiver' there must be an intentional relinquishment of a right with both knowledge of its existence and intention to relinquish it. American Locomotive Co. v. Chemical Research Corp., 1948, 6 Cir., 171 F. 2d 115; see also Wilson & Co., Inc. v. Fremont Cake & Meal Co., 1948, D. C. Neb., 77 F. Supp. 364,380. Contractors did not waive the contract provision for arbitration."

(1) McElwee-Courbis Construction Co. v. Rife, 133 F. Supp. 799, U. S. District Court of Penn., Aug. 1955.

Contract Limits Recovery Except for Extra Work

An oral agreement to pay a contractor more than the contract price is usually unenforceable.

Here's a situation that came up in Indiana: A contractor had a "cost plus 5%" contract, which provided that total cost would not exceed $42,000. Actual cost of the work done was $65,836. Some extra material and labor had been furnished at the owner's request. The contractor claimed the owner had orally agreed to pay more than the contract limit.

When the contractor sued for recovery, the court ruled the oral agreement was unenforceable and limited the contractor's recovery to 5% of the

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TAPECOAT is the widely-accepted alternate material that is equivalent to mill-applied hot coal tar protection. With this easy-to-use material, protection can be applied in the field by your own men, because technical know-how, kettles and special crews are not required. You save time and money while providing the long-life protection called for.

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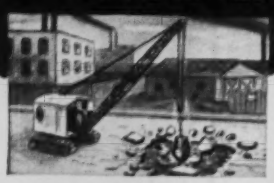

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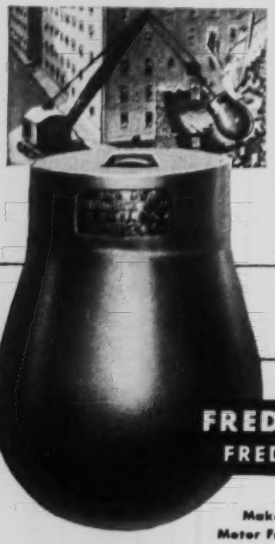

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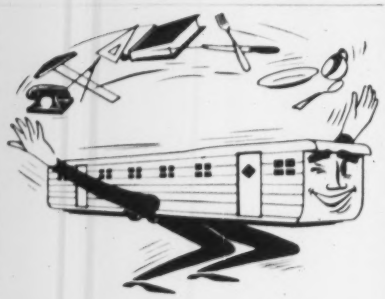

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$42,000, plus 5% of the cost of the extra work.

In discussing the issue of extra work, the court said: "The furnishing of the extra material and labor by a builder in connection with the contract and at the request of the owner is a sufficient consideration for the owner's agreement to pay additional compensation. 9 C.J., Building and Construction Contracts, Section 53, note 9, page 719; 17 C.J.S., Contracts, Section 364, note 29, p. 822; Duncan v. Board of Commissioners of Miami County, 1862, 19 Ind. 154."[1]

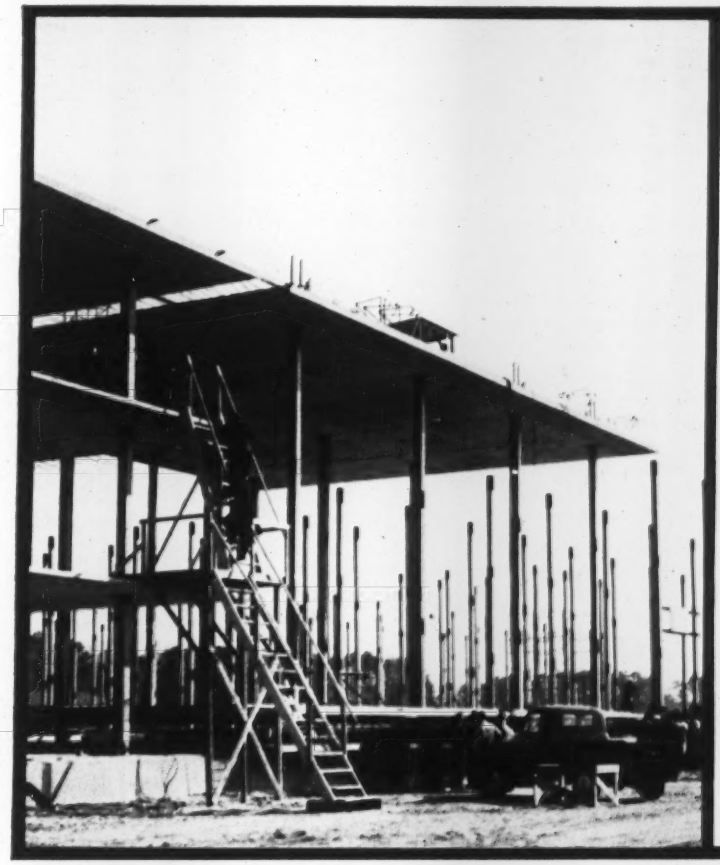
As to the claim of the contractor that the owner orally agreed to pay the contractor more than the amount stipulated in the contract, the court stated: "The rights and obligations of the parties were fixed by the written contract and any promise by appellants (owners) to pay appellee (contractor) extra for doing what the contract bound him to do would lack a consideration, unless special circumstances would take the case out of the general rule, as were apparent in Mills v. Riley, 1855, 7 Ind. 137; Coyner v. Lynde, 1858, 10 Ind. 282; Brownlee v. Lowe, 1888, 117 Ind. 420, 20 N.E. 301; and Sargent v. Robertson, 1897, 17 Ind. App. 411, 46 N.E. 925. The facts apparent here show no such special circumstances and are not widely dissimilar to those found in Leggett v. Vinson, 1929, 155 Miss. 411, 124 So. 472. It is acknowledged that the courts are not in agreement on the question. See the annotations in 25 A.L.R. 1450, 1456; 55 A.L.R. 1333; 138 A.L.R. 136. However, the cases of Wendling v. Snyder, 1903, 30 Ind. App. 330, 65 N.E. 1041, and Brownlee v. Lowe, supra, are quite definite as to the rule favored in Indiana."

(1) Shanks v. Fisher, 130 N.E. 2d 231, Appellate Court of Indiana, Dec. 2, 1955.

Contract Renunciation Must Be Unequivocal

Renunciation of a contract, to be treated as such by the opposite party, must be clear and unequivocal so that the party will be informed that he need not expect anything further upon the contract from the other side. To make the renunciation a breach of the contract, the other party must treat it as a breach and act upon it.

In an Ohio case,[1] the corporate defendant agreed to manufacture oil burners and to give plaintiff the exclusive selling rights for the burners. Later the defendant's president informed plaintiff by letter that the defendant was no longer interested in



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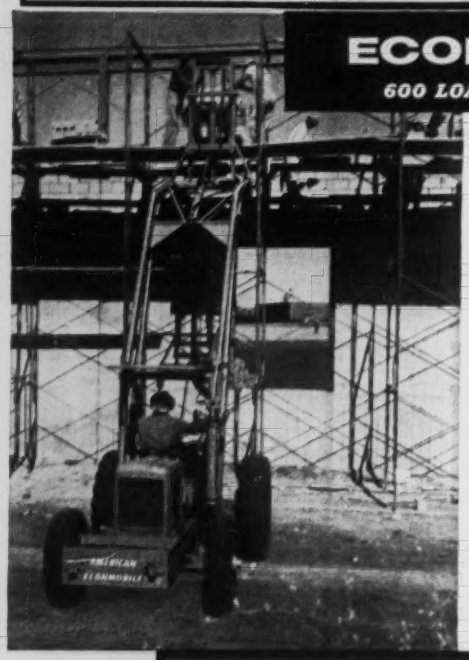

Equipped with pallet fork, the ECONMOBILE can service the scaffold up to a height of 18 feet. With auxiliary tower, it has a hoisting height of 22 feet.

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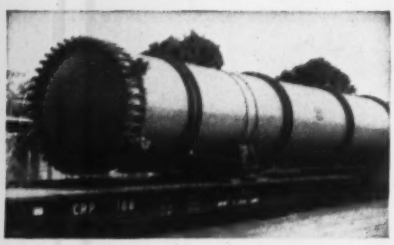

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continuing the connection and that plaintiff should consider the arrangement cancelled. The plaintiff brought an action for breach of contract and was allowed a recovery, the court holding that the letter was a renunciation of the contract.

The court held that where a party bound by an executory contract repudiates his obligations or disables himself from performing them before the time for performance, the promisee may elect to treat the contract as ended, so far as further performance is concerned, and maintain an action at once for anticipatory breach, just as he could where repudiation or disablement occurred during performance.

The filing of the action for breach of contract by the plaintiff, after the defendant renounced it, precludes the defendant from later retracting the renunciation.

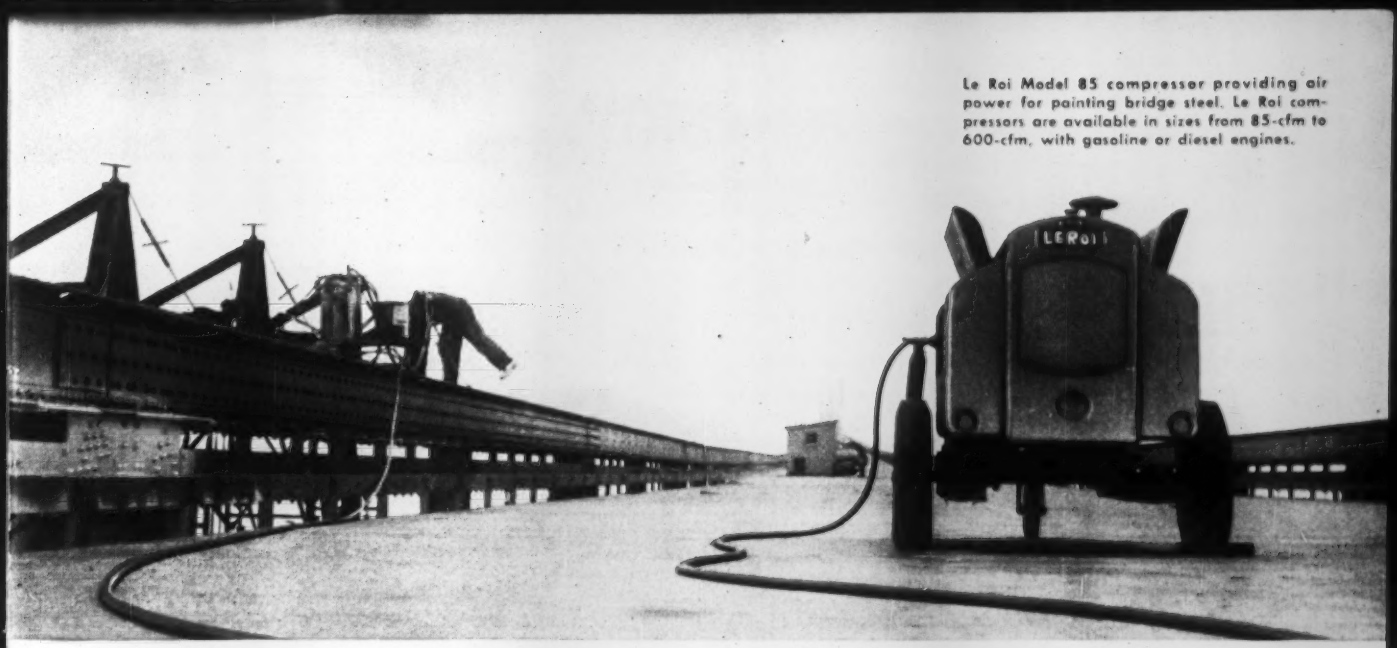
(1) Gilmore v. American Gas Machine Company, 129 N. E. 2d 93, Court of Common Pleas of Ohio, Aug. 1952.

Subcontractor's Liability For Delayed Performance

A prime contractor, against whom a judgment has been rendered for liquidated damages for delayed performance, may be able to recover part of his loss from his subcontractor, if the sub was partly responsible for the delay and if he can prove the extent of the sub's responsibility.

One of the federal courts has summed the problem up this way:

"As for the $3,000 claimed by the prime contractor as that part of the $9,000 liquidated damages attributable to the subcontractor's breach, we do not doubt that in an appropriate case the law imposes liability for damages of this nature. In Krauss v. Greenberg, 3 Cir., 137 F. 2d 569, certiorari denied 320 U.S. 791, 64 S. Ct. 207, 88 L. Ed. 477, the precise question was raised. In a studied and well-reasoned opinion by Judge Goodrich it was held that as a matter of Pennsylvania law and under the circumstances there present, the prime contractor on an Army legging contract should recover the liquidated damages assessed against him by the Government for delayed performance, from his webbing subcontractor who was in default. However, the proof introduced in the present case was not sufficient to support a recovery for this item of damages. In the Krauss case, there was evidence from which the jury specially found that the subcontractor knew there was a liquidated damages clause in the prime contract



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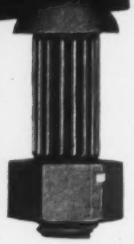

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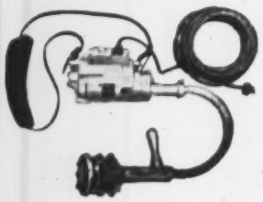

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when the subcontract was made; and there was evidence that the subcontract contained a schedule of deliveries, that the subcontractor failed to meet this schedule, and that this was the sole cause of the delay in the prime contractor's performance. Here, there was no proof that the subcontractor knew of the clause; there was no delivery date specified in the written subcontract nor any proof of what a reasonable time would be; the delay was found to be the result of defective millwork, not the failure to meet a specified delivery date; and the proof showed that there were other causes which contributed to the 90 days' delay. The proof in the present record is clearly inadequate to support any recovery on this item."

In a footnote, the court observed that in addition to the authorities cited in the Krauss case, the subject is discussed in: "Development in the Law-Damages," 61 Harvard Law Review 113; Fuller and Perdue, "The Reliance Interest in Contract Damages," 46 Yale Law Journal 52,373.

(1) United States v. A. J. Rife Const. Co., Etc., 224 F. 2d 609, U.S. Circuit Court of Appeals, June 30, 1955.

A Release May Be Required Before Last Payment Is Due

Where a contract provides that a subcontractor, on completion of his work, must give the general contractor and owner a release that will protect them from all claims arising out of the sub's work, the sub cannot obtain his final payment until the release has been executed and delivered.

In a New York case, for example, a subcontractor sued the prime contractor to recover an amount it claimed was due under a contract for excavation and grading work.

The contract specifically provided that: "Prior to final payment, the subcontractor shall execute and deliver to Turner (the contractor), a general release in a form satisfactory to Turner, holding Turner and the owner free and harmless from all claims arising out of, or in connection with, this contract."

The subcontractor made an application to the court for the amount claimed due under the contract. The general contractor interposed the defense that under the terms of the contract, the execution and delivery of the general release was a condition precedent to the right of the subcontractor to the balance of any sums that might be due it under the contract. The subcontractor claimed that such provision of the contract had

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been waived. The court denied the subcontractor's application.

The court stated: "It is important to note that the complaint fails to allege facts showing waiver of this particular condition precedent. The general rule, of course, is that a plaintiff may not show waiver of performance without pleading the same and alleging the facts and circumstances constituting the waiver. Ohlbaum v. Commercial Casualty Ins. Co., 218 App. Div. 842, 219 N. Y. S. 56. Therefore, the court concludes that, where a plaintiff proceeds on the theory of due performance and his claim is disputed by the defendant in its entirety because of the alleged failure to perform a condition precedent, the plaintiff may not on summary motion recover full or partial judgment upon the theory that the performance of the particular condition was waived."

The subcontractor also contended that the execution of the release was unnecessary because of a provision in the printed form of contract used by the parties that provided that the subcontractor would fully protect the contractor and owner. As to this claim on the part of the subcontractor, the court stated: "This is another way of saying that the furnishing of the release was not a condition precedent. The parties, however, did expressly stipulate that the same was to be executed and delivered by plaintiff 'prior to final payment.' The fact is that the provision (for a general release) therefor was added as a typewritten rider to supplement the printed provisions of the contract, and such fact is a clear indication of the intent that the furnishing of the release was added as a specific requirement prior to final payment. The general rule is that the provisions of a typewritten rider addendum will prevail over the printed provisions of a contract. The typewritten provisions are always to be given effect especially where they enlarge upon the printed provisions. See, 17 Corpus Juris Secundum, Contracts, Section 310, pages 728-730, and cases cited. By virtue of this particular typewritten rider to the contract, the parties here especially agreed upon the furnishing of a certain instrument as a condition of final payment, and the court has no right to disregard such agreement."

(1) R. J. Marshall, Inc. v. Turner Construction Co., 139 N. Y. S. 2d 55, Supreme Court, Dutchess County, N. Y., March 1955.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

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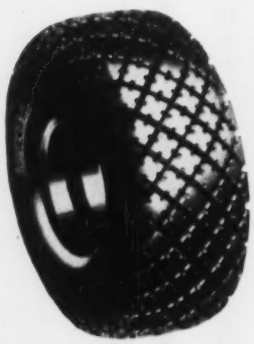

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Part 5—Fuels, Petroleum, Aromatic Hydrocarbons, and Engine Antifreezes—117 out of 242;

Part 6—Electrical Insulation, Electronic Materials, Plastics and Rubber—148 out of 300;

Part 7—Textiles, Soap, Water Paper, Adhesives, and Shipping Containers—166 out of 354.

Single volume prices are: 1 and 3, $13.50 each; 6, $13.00; others, $11.00 each.

Plastic Behavior of Metals

Introduction to Plasticity—By Aris Phillips. 230 pp. The Ronald Press Co., New York, N. Y. $7.

Publication of this book is particularly timely in view of recent developments that bring closer acceptance of plastic design of structural steel. At the Eighth National Engineering Conference of the American Institute of Steel Construction, which was devoted to this subject, the belief was expressed that design rules may be available in about one year (ENR Apr. 12, p. 24).

Plastic theory makes possible the calculation of ultimate strength of structures made of ductile metal, thus enabling designers to utilize the strength still available after the yield point has been reached at some places. For the purpose, a simplified stress-strain relationship is used.

This book is written from the point of view of stress analysts. In general, the mathematics is not too difficult, and proofs of some of the theorems are given in the appendix, so as not to complicate the discussion.

The author presents methods for computing the collapse load of trusses, beams and frames, including curved bars. He also covers plastic analysis of bending with axial force and collapse under combined stresses. There is also a chapter on strain hardening under combined stresses.

Undoubtedly, simpler treatments of plastic theory, with heavier emphasis on design applications, are now being prepared. But until they are available, engineers should find this text excellent preparation for coming developments in this new field.

Building Services

Mechanical and Electrical Equipment for Building—Third Edition, by C. M. Gay, C. de van Fawcett and W. J. McGuinness. 564 pp. John Wiley & Sons, Inc., New York, N. Y.; Chapman & Hall, Ltd., London. $8.50.

This extensively revised book covers the design, specification, installation, operation and maintenance of machinery in buildings. Increased size of the third edition permits the authors to give more attention to basic principles, as well as to discuss additional advanced practices.

The section on elevators and moving stairs is larger. Underfloor duct systems are now included. New data are presented on recently developed pumps, baseboard heating, forced warm air heating, radiant heating, zoning systems and controls for hot water heating, and the Metro system of steam heating. And the chapters on lighting have been brought up to date.

Miscellaneous Notes

• **Bomb effect**—A report on research investigations made for the Atomic Energy Commission by Pittsburgh-Des Moines Steel Co. describes results of a theoretical analysis of the effects of atomic bomb blasts on elevated tanks and standpipes. This publication, titled "The Effects of Atomic Bomb Blasts on Elevated Tanks and Standpipes", is available from the Office of Technical Services, Department of Commerce, Washington 25, D. C. Price 70¢.

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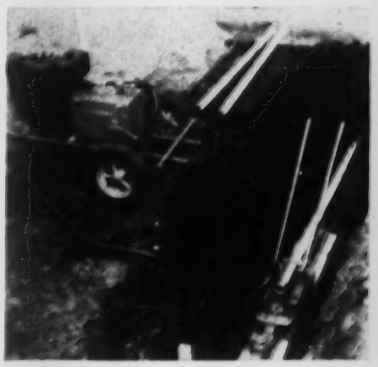

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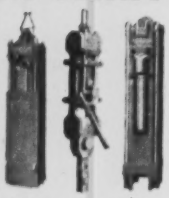

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tronic digital computers has been completed by the Army and released by the U. S. Department of Commerce. It is the result of a survey of 84 computer systems. Each system is described; its applications are given; its costs are divulged. A comprehensive bibliography, a list of domestic manufacturers and a glossary are included. Titled "A Survey of Domestic Electronic Digital Computing Systems," the report is by Martin H. Weik, Aberdeen Proving Ground. It is available from Office of Technical Services, U. S. Department of Commerce, Washington 25, price $4.75. It contains 271 pages.

New Engineering Books

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PROFESSIONAL ENGINEER'S EXAMINATION QUESTIONS AND ANSWERS—by William S. LaLonde, Jr. 462 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36. $6.50.

HYDRAULIC INSTITUTE STANDARDS—Hydraulic Institute, 122 E. 42nd St., New York 17, N. Y. $4.75.

CONCRETE AND CONSTRUCTIONAL ENGINEERING—Fiftieth Anniversary Number—Concrete Publications Limited, 14 Dartmouth St., London S. W. 1, Eng. 300 pp. 15 s.

COMMON SENSE IN RESEARCH AND DEVELOPMENT MANAGEMENT—by George W. Howard. 104 pp. Vantage Press, Inc., 120 W. 31st St., New York 1. $2.75.

MANUEL DU BETON PRECONTRAINT—by V. Weinberg and R. Vallette. 308 pp. Dunod, 92, rue Bonaparte, 92, Paris VIe, France.

MATERIALS HANDBOOK—by George S. Brady. Eighth edition. 1022 pp. Mc-

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View of turbine room in Ingalls-fabricated powerhouse; 7 units in operation; 150,000 kw units in foreground

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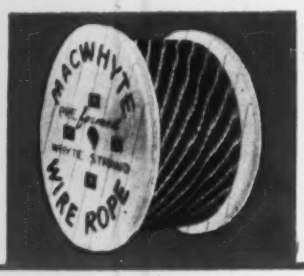

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Graw-Hill Book Co., 330 W. 42nd St., New York 36. $11.00.

Plastics Progress 1955—432 pp. Philosophical Library, 15 E. 40th St., New York 16. $17.50.

Construction Planning, Equipment, and Methods—by R. L. Peurifoy. 534 pp. McGraw-Hill Book Company, 330 W. 42nd St., New York 36. $8.50.

Soil Physics—Third Edition—by L. D. Baver. 489 pp. John Wiley & Sons, 440 Fourth Ave., New York 16. $7.75.

Significance of Tests and Properties of Concrete and Concrete Aggregates—Special Technical Publication No. 169. 387 pp. American Society for Testing Materials, 1916 Race St., Phila. 3, Pa. Paper Cover $5.25; to ASTM members $4.00. Cloth cover $6.00; to ASTM members $4.75.

Reports and Pamphlets

Proceedings of the 41st Annual Road School—Extension Series No. 88. Engineering Extension Dept., Purdue University, Lafayette, Ind.

Cold Mix Asphalt Patching Mixtures—Bulletin No. 22. Engineering Experiment Station, University of Arkansas.

Factors Related to Frost Action in Soils—Bulletin 111. Highway Research Board, 2101 Constitution, Washington, D. C. $2.25.

General Location of National System of Interstate Highways—Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 55c.

Ungraded Aggregates in Bituminous Mixes—Bulletin 109. Highway Research Board, 2101 Constitution, Washington, D. C. 90c.

Acceleration of Road Improvements Through Bond Issues—National Highway Users Conference, National Press Bldg., Washington 4, D. C.

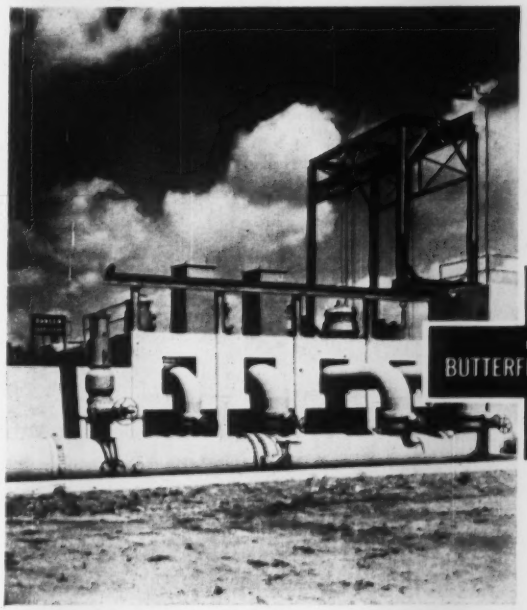
Toll Road Facilities in the United States—Second Edition. Compiled by Edwards, Kelcey and Beck, consulting engineers, 3 William St., Newark, N. J.

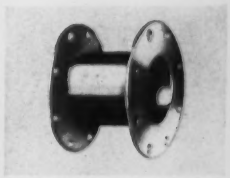
Slums and Blight—A Disease of Urban Life—Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15c.

Proceedings of the First Mariemie Soil Mechanics Conference April, 1954—Technical Memorandum No. 35, Division of Building Research, National Research Council, Ottawa, Canada.

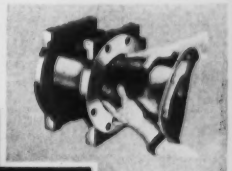
Digest of Sewerage Enabling Acts—State Water Pollution Control Board, Sacramento, Calif. 50c.

Use of compact R-S Rubber Seated Butterfly Valves in this common header permitted close coupling of all pipe, resulted in a substantial saving.





Renewable and replaceable rubber seat . . .



. . . Is installed in valve body . . .

. . . And positions with flanges fitting body flange holes.

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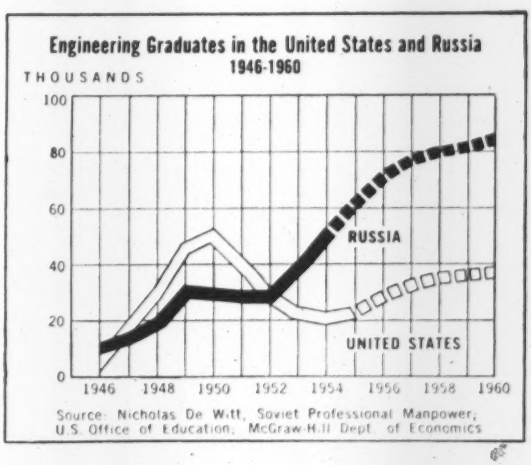
THE SHORTAGE OF SCIENTISTS AND ENGINEERS:

Are We Losing the Race with Russia?

THERE is new confidence in the Kremlin. One key reason is expressed in a recent boast of Communist Party Secretary Khrushchev: **"The capitalists always regard our people as being backward, but today we have more engineers and more supporting engineering technical personnel than any capitalist country."** He promised that this lead would be widened and that communism would be victorious without war.

This boast cannot be dismissed as communist propaganda. Admiral Lewis L. Strauss, chairman of the U. S. Atomic Energy Commission, has warned: **"In five years our lead in the training of scientists and engineers may be wiped out, and in ten years we could be hopelessly outstripped. Unless immediate steps are taken to correct it, a situation, already dangerous, within less than a decade could become disastrous."**

This second editorial in a series on the shortage of scientists and engineers is designed to explore as carefully as possible the facts and the implications of the new emphasis on technical training in the Soviet Union. It draws heavily from the authoritative book *Soviet Professional Manpower*, prepared for the National Academy of Sciences and the National Research Council by Nicholas DeWitt of the Russian Research Center of Harvard and released recently by the National Science Foundation.



Trend Is Against Us

If the Soviet Union already has a lead in technical manpower, it is not very great. Both the United States and Russia now have around a million scientists and engineers. About a third of the Russian engineers were trained on inferior pre-1935 standards. **It's the trend — shown in the chart — that is alarming.**

Over the last five years we have turned out only 142,000 engineers, compared to an estimated 216,000 in Russia. In 1955 our output was around 23,000 compared to their 63,000. Over the next five years our projected output is 153,000, against at least 400,000 in Russia. There will be an additional 150,000 or more in the satellites and Red China.

In Russia, 30% of the college students are in engineering, compared to 8% here. Another 30% or more take degrees in natural sciences. Moreover, unlike ourselves, the Russians are

ploughing back a large proportion of their science graduates into teaching, which implies a rapid buildup in the future.

Quality As Well As Quantity

It would be foolhardy to assume that these new Russian graduates are inferior to ours in the quality of their technical training. They start out with much more intensive mathematical and scientific preparation at the high school level. They study harder and longer in college, with more laboratory work and more practical training. Their courses and textbooks seem to be as thorough as ours. Even though the Russian graduates may be overspecialized, they get results.

These results have been striking. The Russians developed both A-bombs and H-bombs faster than we expected, and it's not certain that they had to rely much on espionage. They pushed ahead of us for a while in jet fighter design, and they showed up with a fleet of long-range bombers well ahead of schedule. They are crowding us on nuclear power, electronics and automation. There are grave fears that they have established a lead in the vital field of military rockets.

The goal of Soviet scientific manpower policy includes not only weapon supremacy but also leadership of the neutral and uncommitted areas of Asia, Africa and the Middle East. The Soviet leaders may be bluffing in their offers to export capital, but they are preparing to export Russian scientific and technical know-how in a big way.

How They Do It

The Russians are determined to win the race for scientific supremacy, and they do not count the cost. **They pay their scientists and engineers salaries that seem fantastic when compared with other Soviet incomes.**

Senior professors, research scientists and top engineers are a major segment of the Russian elite. Their incomes are frequently six to ten times the average industrial wage. (In the U. S. six to ten times the average industrial wage would be $25,000 to $40,000 a year.) Housing and other privileges are correspondingly lavish. While preaching equality, the Soviets use capitalistic incentives far more boldly than we do. Indeed, practicing engineers and scientists have been complaining about the exalted status of professors and top research people, and salary scales are now being adjusted to give greater emphasis to practical results.

The Russians are also generous in their aids to education. Tuition has just been made free at all levels. Undergraduates receive 200 to 500 rubles a month and graduate students 800 rubles (about equal to an industrial wage) to cover living expenses. The biggest stipends go to science and engineering students. College students are deferred from military service, and engineers and scientists often enjoy continued deferment even after graduation.

Finally, the Soviet leaders can channel engineers and scientists — and all other human and material resources — into any area they choose. And the areas the Soviet leaders choose are predominantly those that contribute to military or political objectives, rather than to a better life for consumers.

What's Our Answer?

We are certainly not going to adopt Soviet methods. We do not want scientific robots, but free men, able to understand and add to our democratic heritage. At the same time, our world leadership in technology — and perhaps even our survival as a nation — will be threatened if we allow ourselves to lag far behind Russia in the training of scientists and engineers. Ways to keep the United States in the race will be discussed in a later editorial in this series.

This is one of a series of editorials prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments of particular concern to the business and professional community served by our industrial and technical publications.

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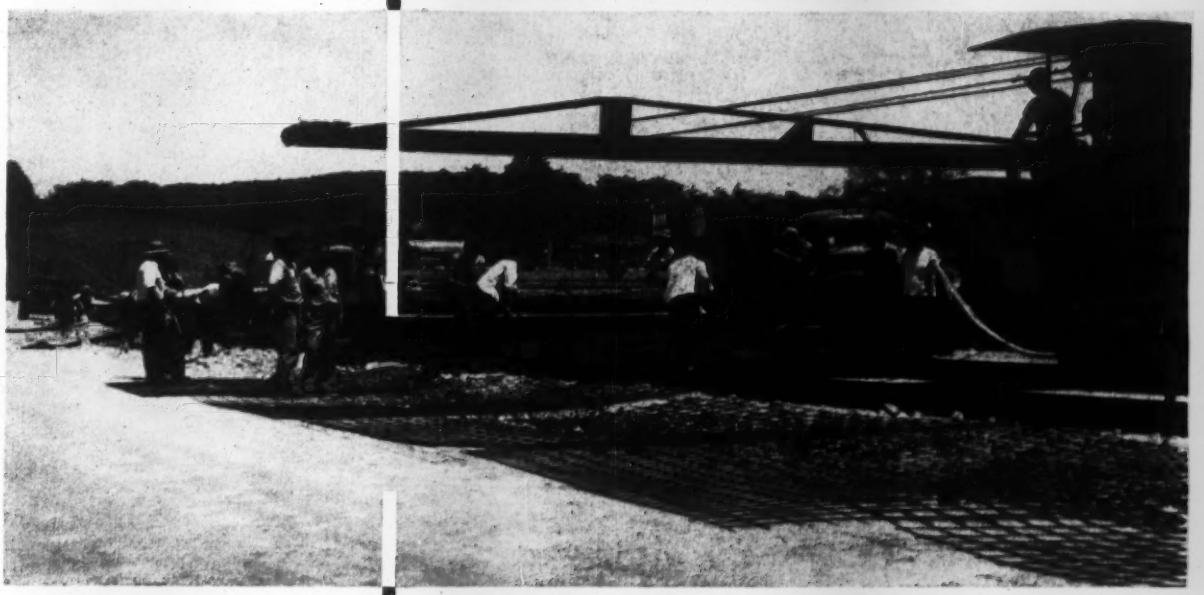

Clinton Welded Wire Fabric provides the backbone that highways need to stand up under today's heavy traffic loads.

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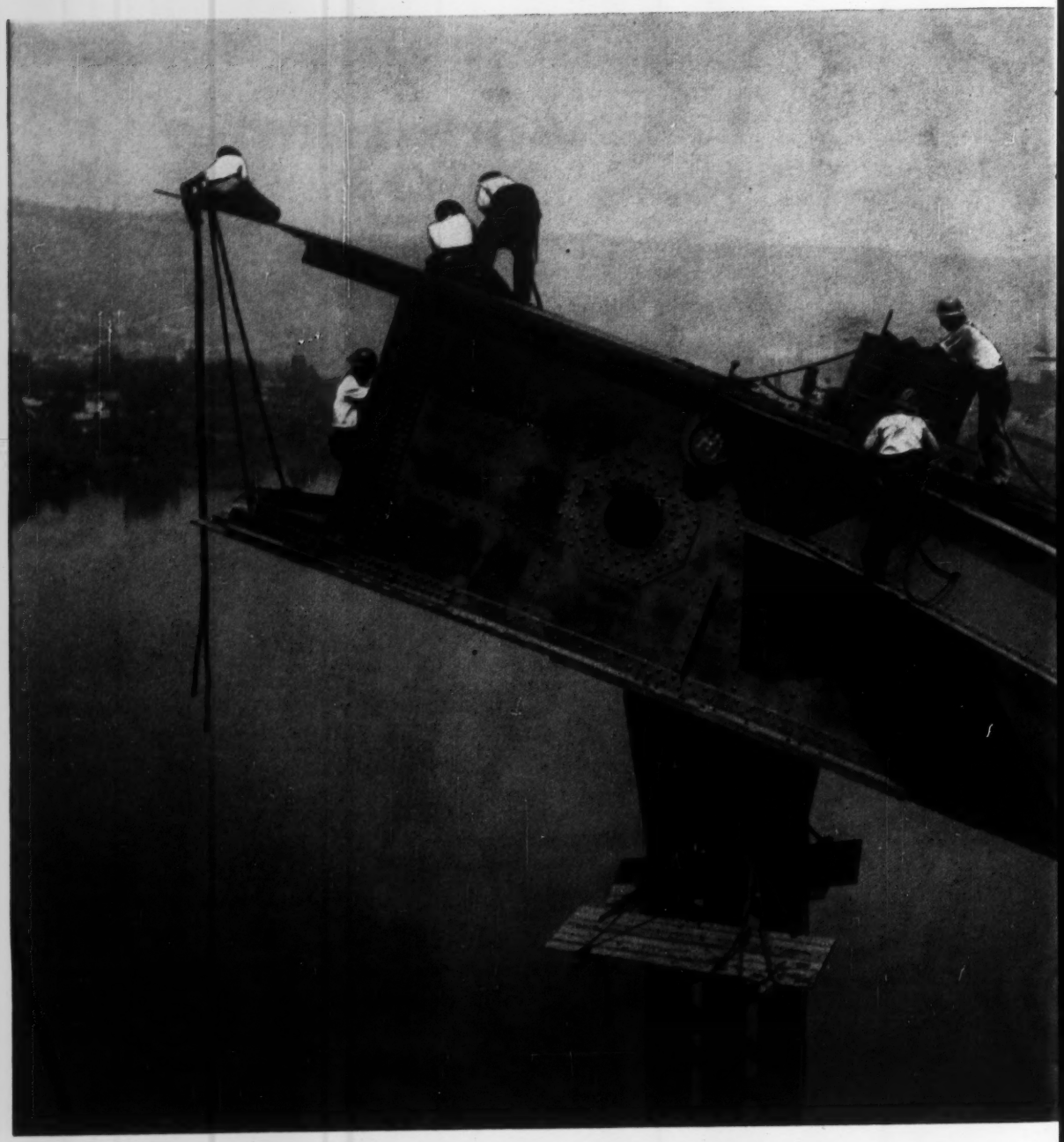
65 major bridges have been



USS HIGH STRENGTH STEELS

—the big step forward in bridge construction

built with USS High Strength Steels

—and every month the list is growing

NOTHING SUCCEEDS like success. Less than ten years ago, the bridges built with USS high-strength, low-alloy steels could be counted on the fingers of one hand. But look around the country today and you'll find 65 major bridges that have been built with stronger, more durable USS High Strength Steels.

This phenomenal growth in the use of USS High Strength Steels is the result of an ever-increasing recognition of their advantages. Bridge engineers have found in steels like USS MAN-TEN and USS TRI-TEN "E" *superior* materials of construction with which they can (1) obtain greater strength with no increase in weight, (2) reduce weight without any sacrifice in strength, (3) insure greater durability, and (4) frequently reduce costs as well.

Here are some of the prominent bridges which have benefited by the use of USS High Strength Steel:

USS MAN-TEN STEEL

Ohio River Bridge, Wheeling, W. Va.	2,500 tons
Maumee River Bridge, Toledo, Ohio	1,913 tons
Delaware River Turnpike Bridge	11,070 tons
Red River Bridge, Shreveport, La.	2,000 tons
St. Charles Bridge, St. Charles, Mo.	3,230 tons
Penn-Lincoln Parkway Ramp, Pittsburgh, Pa.	2,300 tons
Pass Manchac Bridge, Pontchatoula, La.	1,360 tons
Inner Belt Freeway Bridge, Cleveland, Ohio	4,800 tons
Canal Bridge, Orleans Parish, La.	1,635 tons

USS TRI-TEN "E" STEEL

Columbia River Bridge, Umatilla, Ore.	1,864 tons
Paseo Bridge, Kansas City, Mo.	3,759 tons
Ohio River Bridge, Shawneetown, Ill.	2,295 tons
Missouri River Bridge, Jefferson City, Mo.	1,692 tons
Kansas Turnpike Bridge	1,800 tons
Missouri River Bridge, Kansas City, Mo.	1,525 tons

We think this list, though far from complete, speaks for itself. Significant, too, is the fact that USS High Strength Steels are being specified for many of the major bridges projected for the immediate future.

We will be glad to discuss with you how these superior structural steels can be incorporated into your designs to provide maximum strength, safety and durability with a minimum of weight and cost.

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UNITED STATES STEEL

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Prestressed Concrete to Speed Maryland Bridge

This $174,094 bridge will have precast prestressed concrete beams, the top flanges of which will be covered with bituminous concrete to serve as riding surface. This design of Albert L. Grubb, Chief, Bureau of Bridges, Maryland State Roads Commission in Baltimore, will help the contractor to complete his work within the nine months allowed for the job.

The single span bridge of 69 ft 4 in., with a 34-ft roadway, a 5-ft sidewalk and a safety curb of 1-1 ft 6 in., is located in Prince Georges County, Md., about one mile northeast of Washington D. C. Vertical clearance over the northwest branch of Anacostia River will be 20 ft. The existing road has to be raised to pass over the proposed U. S. Army Engineers' channel and levee. Bridge abutments will be curved to follow the curved face of this channel.

E. H. Nunn Construction Company, Inc. of Baltimore got the contract. His low bid topped the engineer's estimate by 11.5%.

In addition to the construction and paving work the contract calls for 13,195 cu yds of excavation, drainage and the maintenance of traffic. Specifications require that 5,000# concrete contain 7½ bags of cement and 3,000# concrete 6½ bags per cu yd. The alternate for slag aggregate drew no bids.

Skilled laborers will be paid $1.15 per hour, semi-skilled workers $0.90 and common laborers $0.75.

The bidders include:

1C E. H. Nunn Const. Co., Inc., Baltimore, Md.	$174,094
2 Contee Sand & Gravel Co., Laurel, Md.	184,009
5 Allied Contr. Inc., Baltimore, Md.	206,580
EE Albert L. Grubb, Chief, Bureau of Bridges, Md. State Rds. Comn., Baltimore, Md.	156,200

Bids: 2-14-56 Items	Unit	Quantity	Unit Prices 1C	2
Excav, cl 1	cy	250	$1.00	$1.15
cl 2	cy	25	1.50	2.10
cl 3	cy	370	4.00	15.75
cl 4	cy	1,050	16.00	12.00
borrow	cy	11,500	1.75	2.20
Curb & gutt, remove	lf	1,000	0.80	1.05
Inlets, remove	ea	4	150.00	68.25
Masonry, remove	cy	30	30.00	26.25
Manhole, remove	ea	1	100.00	57.75
Fdn layer, screen, 2"	sy	3,300	1.00	0.55
Base crse, macadam, 10"	sy	3,300	2.25	3.00
Gravel shoulders, 6" deep	sy	750	1.50	0.52
Calcium chloride	t	2	90.00	85.00
Surf crse, gravel, 12"	sy	1,000	2.00	1.05
Prime coat, bit matl	gal	1,475	0.11	0.14
Tack coat	gal	30	0.40	0.25
Surf treat, bit matl	gal	3,850	0.15	0.14
mineral agg.	t	140	4.50	5.50
B surf crse, bit conc, 1½", stone agg.	t	390	10.00	8.00
2", stone agg.	t	510	10.00	8.00
Backfill, select	cy	50	3.95	4.72
Pipe, type B, ACCM*, 14" gage, 12"	lf	132	3.75	5.25
15"	lf	136	4.50	6.30
RCC, 15"	lf	62	5.00	4.46
Bends, ACCM, 12", 45	ea	2	30.00	36.75
15", 90	ea	2	40.00	52.50
Pipe connections, 15x18"	ea	2	75.00	52.50
Pipe culv, remov, sta 0+	ls	job	400.00	262.50
sta 7+	ls	job	400.00	262.50

Itids: 2-14-56 Items	Unit	Quantity	Unit Prices 1C	2
Conc, cl P-1, for pipe end-walls	cy	2	100.00	94.50
Comb inlet, type H, vert depth	lf	12	55.00	78.75
Inlet, type K, 15" pipe, vert depth	lf	5	50.00	73.50
grate & frame, type E	ea	3	140.00	183.75
K grate & frame type A	ea	2	50.00	78.75
heads, type H	ea	3	185.00	204.75
Manhole, std, vertl depth	lf	5	35.00	57.75
frame & cover ype A	ea	1	50.00	63.00
Pile drive equip, move on & off site	ls	job	800.00	2,500
Piles, timber, cl B, untr.	lf	4,600	1.90	1.79
wings, steel sheet	sf	1,500	4.50	6.33
Superstruct, conc, with prestress conc beams	ls	job	35,000	38,000
Conc,cl A, in substruct	cy	500	60.00	65.00
cl C	cy	25	20.00	25.00
Backfill, porous	ls	job	1,000	548.00
Drill holes in exist msry	lf	20	3.00	1.00
Curb, 8x22", type A conc, mod, cl P-1 conc	lf	200	3.00	4.20
Curb & gutt, type B, cl P-1 conc	lf	140	3.50	6.30
Guard fence, 3 cable, stl posts, 12' c/c	lf	72	2.85	4.88
16' c/c	lf	448	3.35	2.88
on conc cribb incl posts & fittings	lf	130	4.50	5.46
Cribbing, conc	sy	120	50.00	52.50
Inspector's office, No. 2	ls	job	1,000	1,000
Pave, RC, patch, 9"	sy	25	9.00	10.50
Traffic, maintain	ls	job	7,500	4,000
Topsoil, 2", f & p	sy	3,200	0.60	0.31
Seed & mulch	sy	3,200	0.15	0.18
Sodding, solid	sy	100	0.75	0.52

To be completed: 11-30-56
Liquidated damages: $50.00 per day
* ACCM—Asbestos covered corrugated metal

Earth Fill Dam in Kansas

The dam, 2,000 ft long with a maximum height of 40 ft, will cost $84,069. It will create Hamilton County State Lake near Syracuse, Kansas, for recreational use. Wilson & Co., Salina, Kan., are architect-engineers for the State Department of Administration, Topeka, Kan.

Beavers Construction Company of Hugoton, Kan., got the contract on a low bid that was 28.5% under the second bid and 22.8% under the engineers' estimate.

In addition to the dam work includes a concrete drop inlet spillway and gravel road around the lake.

Class A concrete must test at 3,500 lb after 28 days.

1C Beavers Const. Co., Hugoton, Kansas	$84,069
2 L. W. Rexroad & Son, Salina, Kansas	117,542
9 Edward Peterson Co., Omaha, Nebraska	213,373
EE Wilson & Co., Salina, Kansas	108,886

Bid: 2-15-56 Items	Unit	Quantity	Unit Prices 1C	2
Clear lake & dam site	ls	job	$3,500	$2,000
Excav, earth	cy	194,000	0.13	0.25
Spillway & outlet works	ls	job	17,200	22,873
Riprap	sy	11,000	1.37	1.50
Fence	rod	1,270	4.00	3.50
gates	lf	64	4.00	4.00
remove	rod	720	0.75	0.50
Grade, linear	sta	137	9.13	25.00
Culv, pipe, MAP* 22x13"	lf	292	3.15	4.25
43x27"	lf	180	9.21	11.00
58x36"	lf	238	12.46	14.00
Clear parking lot	sy	4,500	0.05	0.10
Guard rail	lf	720	2.90	2.00
Surface, gravel	t	5,200	0.75	1.25
Seed & mulch	ac	14	178.00	200.00
RC for farm crossing	cy	48	40.00	30.00
Completion date			8-15-56	10-30-56

* MAP—Metal, asbestos protected

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Just sprinkle on the leveled and floated fresh concrete surface, then work into the surface with a wood float and finish with a steel trowel. You'll be amazed at the brilliance and depth of the two beautiful colors: Tile Red and Spanish Green.

Remember . . . ART-ROC is not just a surface film, but color that's built-in to stay . and it's so easy to use!

- Terraces
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Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Apr 19 — Wood Products, Glass, Explosives, Chemicals
- Apr 26 — Clay Products, Lime, Plaster, Paint, Roofing, Wage Rates, Building Board, Lath, Insulation
- June 7 — Cement, Aggregate, Ready-mixed Concrete, Asphalt

IRON AND STEEL PRODUCTS — PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES	PLATE CARBON STEEL	REINF BARS billet	RIVETS ½-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$4 60	$4 50	$4 65	$9 25		$94 50	$113 00	$5 825	$7 90	$5 625	
Chicago Area	4 60	4 50	4 65	9 25	$5 45	94 50	113 00	5 825	7 90	5 625	
Pittsburgh Area	4 60	4 50	4 65	9 25	5 45	94 50	113 00	5 825	7 90	5 625	$11 50
Buffalo Area	4 60	4 50	4 65	9 25	5 45	94 50	113 00	5 825	7 90	5 625	11 50
Cleveland			4 65	9 25	5 45						11 50
Youngstown Area			4 65						7 90		
Geneva	4 60	4 50									
Los Angeles					5 45				7 90		
Pueblo	4 90	5 35	5 10				95 00	5 825	7 90	5 625	12 40

IRON AND STEEL PRODUCTS — F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price, 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$7 78		$8 25†	$50 00	$55 00	
Baltimore	8 03	7 52‡		39 00	43 50	
Birmingham	7 28†	7 12†	7 12†	61 00p	67 00p	4 × 16 in., No. 5 & 10 wires — Joliet, Ill.; Donora, Pa., Monessen, Pa. $3 40
Boston	8 27a	7 82	7 82	44 00	48 50	
Chicago	7 43	6 23gu	6 23gu	49 00‡	60 00‡	4 × 12 in., No. 8 & 12 wires — Joliet, Ill.; Donora, Pa., Monessen, Pa. $2 92
Cincinnati	7 90uk	7 56rr		41 00mn	45 50mn	
Cleveland	7 76	6 41c		41 00‡	45 50‡	
Dallas	9 05	7 40	7 40	49 00	52 00	
Denver	8 95	8 00c		54 00n	60 00n	6 × 6 in., No. 6 & 6 wires — Joliet, Ill.; Donora, Pa., Monessen, Pa. $3 57
Detroit	7 90	7 38		56 00	63 00	
Kansas City	7 95a	7 75		49 00	60 00	
Los Angeles	8 15fd	7 60		54 50	60 50	
Minneapolis	7 83d	8 14b	8 14b	42 50	47 00	
Montreal	7.70-8.15fC7.75-8.15A	7.50/8.65t	7.50/8.65	65 00h	70 00h	
New Orleans		7 95uks		44 50	49 50	
New York	8 19	7 35y**	7 35y**	44 50no	51 00no	
Philadelphia	8 04	7 14		42 50‡	47 00‡	
Pittsburgh	7 43	6 57**		42 50	47 00	
St. Louis	7 83s	6 75c	6 75c	57 00l	59 00l	
San Francisco	8 55	7 55j		47 50	53 00	
Seattle	8 50t	7 70s		55 00nr	61 00nr	
Toronto	8 40*	7 25	7 25	53 50mq	67 50mw	

Quantity extras, per cwt.: under 100#, + $3; 100-399#, + $2; 400-999#, + 1.25; 1000-1999#, + 8%; 2000-4999#, base price; 5000-9999#, − 10%; 10,000-19,999#, − 20%; 20,000-29,999#, − 30%; 30,000# and up, − 7½%

EXTRAS, per cwt.: *Quantity: less than 700#, + 50%; 700-1499#, + 25%; 1500-2999#, + 10%; 3000-4999#, + $2.20; 5-9, + $1.10; 10-14, + 55¢; 15-19, + 45¢; 20-49, + 35¢; 50-99, + 25¢; 100-199, + 15¢; 200-299, + 10¢; 300-499, + 5¢; 500-999, + 2½¢; 1000-1999, + 1¢; 2000-4999, base price; 5000-9999, − 1¢; 10,000-19,999, − 2½¢; 20,000-29,999, − 5¢; 30,000# and up, − 7½¢. *Reroll: heavy, + 5%; light, + $2; except in New York City and surrounding industrial area where rerolling must be done on the job; others: Fischer-Tipton details and fabrication from designs by others, over $4,500, 20-299 tons, + 5%; 300-500 tons, + 2½%; over $4,500, 20-299 tons, + 7½% but not over $240; under 5 tons, + 5% but not over $10. †Each mill: + 60¢.

†‡ Delivered. •a 2000-9999#. •b 10,000-15,999#, fob city. •c 20 tons or over. •d 10,000-19,999#. •e Intermediate struct'l. •f Incl. delivering in free zone. •g CL. •h list price; dominion tax exempt; add provincial and municipal taxes. •i add dominion, provincial and municipal sales taxes. •j intermediate and hard grade. •k fob city. •l delivered; contractor to do unloading. •m copper alloy. •n LCL. •o asphalt coated. •p del. of 500 sq. yd. or more. •q 3 lb. •r 2% off for cash. •s 2,000-4,999#. •t add 15¢ del. •u add 6.25¢ switch. •v incl 15¢ del. •w 3.5 lb. •x add 5¢ switch. •y add 30¢ del. •z add 10¢ del. •A American made. •C Canadian made. † Previous prices for struct'l was fob mill. Previous prices for bars was intermediate & hard grade. •* Aver. of Canadian & American. ** 4 tons.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEX‡	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE 12" Saw Cl. 1	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13 44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4-24 PER 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14-41 12 in.	24 in.
Atlanta	115 8	$1 56	$2 60	$ 55	$1 30	$4 95	$13 25	$225 00		$0 88m	$3 25m
Baltimore	125 2	1 56	2 60	665	1 28	5 08r	12 71	187 80	$289 20	1 01	2 75m
Birmingham	111 3	1 56	2 60	44	81	3 55w	10 37w	280 00‡	440 00‡	1 90m	4 00
Boston	127 9	1 58	2 39	672grt	1 296grt	5 31grt		197 40r	303 60r	1 54mg	3 65mg
Chicago	125 7	1 56	2 39	90m	1 74m	6 25m	19 00m	150 00‡	270 00‡	1 00	3 65
Cincinnati	120 5	1 58	2 47	665t	1 2825t	4 905t	12 505	240 00	370 00	80m	2 95m
Cleveland	126 5	1 58	2 47	567r	1 1475r	4 545t	11 787t	149 40m	231 60m	85m	3 25m
Dallas	122 8	1 58	2 73	430	709	4 00b	9 17b			49	1 60
Denver	132 4	1 66	2 73	45n	78n	3 48n				74m	2 50m
Detroit	126 8	1 58	2 47	85	1 65	6 45	17 50	240 00m	370 00m	95	3 82
Kansas City	123 4	1 58	2 47	61	1 105	4 54	12 75	250 00	480 00	90	2 90
Los Angeles	134 8	1 66	2 39	67l	1 46l	5 97l	14 89l	228 20l	348 90l	95	2 75l
Minneapolis	134 3	1 61	2 60	78mo	1 42mo	6 25mo				1 66A	4 47A
Montreal				1 02u	1 80u	6 30u	12 00u			1 17A	3 11j
New Orleans	118 4	1 56	2 60	51	925	5 18		350 00p	550 00p	75	2 50
New York	123 7	1 58	2 39	94	1 78	6 96	18 14			1 15	3 00
Philadelphia	123 1	1 56	2 39	65	1 25	4 95r	12 65r	300 00‡	350 00‡	1 60A	3 95A
Pittsburgh	127 6	1 58	2 39	468m	864m	3 86m	9 78m	152 00	244 00	1 05A	2 50A
St. Louis	121 9	1 56	2 47	56	1 03	4 22	9 80	180 00l	380 00l	1 30l	2 80l
San Francisco	134 8	1 66	2 39	74d	1 62d	6 59d	16 47d	235 00l	392 00l	1 05m	3 30m
Seattle	135 4	1 66	2 39	66b	1 26b	6 34	17 90	205 00c		1 00k	3 10k
Toronto				76	1 425	5 70		157 00	280 00	87	3 05

***WROUGHT STEEL PIPE** (Full standard weight) — Discount from list; see footnote

Mill	3½ to 6 in. Lap Weld Galv. %	Black %	2½ & 3 in. Butt Weld Galv. %	Black %
Lorain, Ohio		19 50a		29 00
Alquippa, Pa.		19 50a		29 00
Sparrows Pt., Md.		13 50a		27 00
Benwood, W. Va.	19 50d	19 50d	29 00	29 00
Youngstown, O.	17 50d	17 50d	29 00	29 00
Indiana Harbor, Ind.	18 50d	18 50d	28 00	28 00
Sharon, Pa.		19 50a		29 00
Wheatland, Pa.		19 50a		29 00
Etna, Pa.		17 50d		27 00
Fontana, Calif.	17 00gh	17 00gh	16 50f	16 50f

Mill	8 in. Galv. %	Black %	10 in. Galv. %	Black %	12 in. Galv. %	Black %
Lorain, Ohio	11 75	29 00	10 75	29 00	10 75	29 00
Alquippa, Pa.	15 25	29 00	10 75	29 00	10 75	29 00
Sparrows Pt., Md.	8 75	27 00	9 75	27 00	9 75	27 00
Benwood, W. Va.	10 75	29 00	10 75	29 00	10 75	29 00
Youngstown, O.	10 75	28 00	10 75	28 00	10 75	28 00
Indiana Harbor, Ind.	9 75	28 00	9 75	28 00	9 75	28 00
Sharon, Pa.					10 75	29 00
Wheatland, Pa.					10 75	29 00
Etna, Pa.					15 25	29 00
Fontana, Calif.					2 75h	16 50f

† Threaded and coupled. a 3½ to 4 in. b Continuous weld. c 5 and 6 in. d 6 in.

‡ Delivered. •a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 111.3; Burlington, N. J., 120.1. •b Extra strength ASTM C 200-44T. •c 4-in., $113. •d SS361-A. •e 30-in. •f 21 in. •g culvert pipe; reinforced, ASTM C 76-41. •h reinforced, ASTM C 75-41. •i reinforced, ASTM C 76-37. •j centrispun; no standard specs. in Canada. •k 2% off for cash. •l fob plant. •m truck delivery. •n LCL delivered, fob truck. •o listed price based on LCL (no min.). •p freight allowed to destination in city. •q ASTM C 13-40. •r CL fob origin, freight allowed. •s 2 ft lengths. •t 3 ft lengths. •u CESA A 60-1941 specs, used. •v standard strength. •w as; add 20%, for d.s.

*** WROUGHT STEEL PIPE:** Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft. (*based on approx. $200 per net ton): Butt Weld ¼ in., 5¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight rates plus 3% transportation tax to get destination price.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld — 1 in. black, + 61.25, galv., + 89.50; 1¼ in. black, + 61.25, galv. + 89.0, 1½ in. black, + 57.75 galv. + 85.25; Lap Weld — 2½ in. to 3 in. black + 63.50 galv. + 89.50; 4½ in. to 6 in. black + 60.50 galv. + 84.75. Add freight rates plus 3% transportation tax to get destination price.

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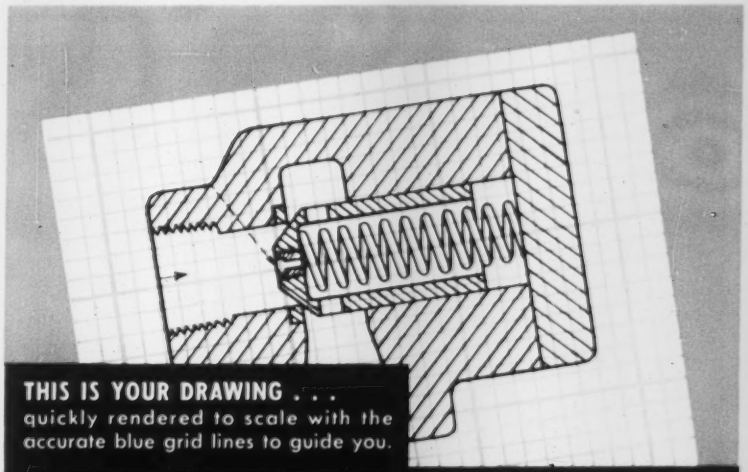

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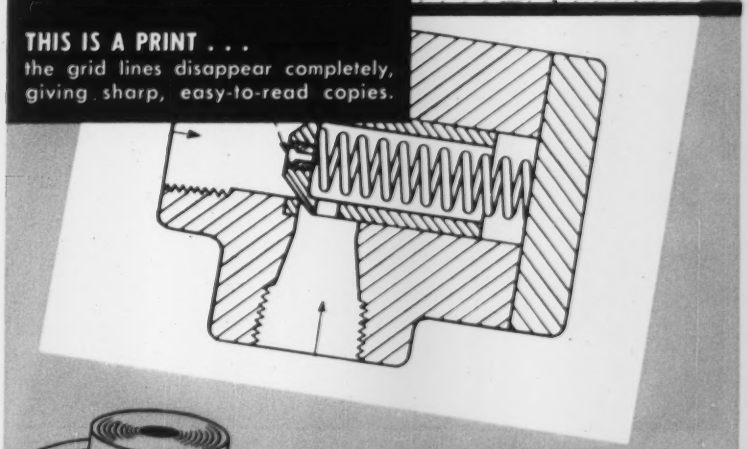

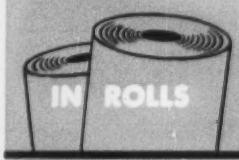

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J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† **Me., Presque Isle**—ROAD RELOCATION—BA *On Or About 5/25*—U. S. Eng., 150 Causeway St., Boston 14, Mass. relocation of Owen Rd., Presque Isle Air Force Base. ENG-19-016-56-161.

BUILDINGS—BA

Mass., Waltham—MANUFACTURING—BA 5/22—W. H. Nichols Co., 48 Woerd Ave., (selected list bidders), mfg. bldg. addn., Woerd Ave. $125,000, Bastille Halsey Assoc., 102 Tremont St., Boston, archts. Cleverdon, Varney & Pike, 120 Tremont St., Boston, engrs. CD 2/2.

▲ **Mass., Westboro**—SCHOOL—BA 5/25—Town, W. W. Fish, chr., High School Bldg. Comm., c/o High St., High school, Franklin Ave. and Fisher St. $1,200,000. Plans deposit $50, refundable. Rich & Tucker Assoc., 45 Newbury St., Boston, archts. CD 4/30.

Mass., Lawrence—HOSPITAL—BA 5/29—Lawrence General Hospital, Abbot Stevens, chn., 1 Garden St., hospital addn. alterations. $600,000. Plans deposit $50. James H. Ritchie & Assoc., 135 Clarendon St., Boston, archts. CD 7/20/54.

Conn., Trumbull—TOWN HALL—BA 6/1—Town, Town Hall, brick, stone, slate, concrete town hall, Church Hill Rd. $450,000. Peter P. Petrofsky, 177 State St., Bridgeport, archt. CD 2/13.

HEAVY CONSTRUCTION—LB & CA

† **Consolidated Constructors, Inc.**, 807 Congress St., Portland, Me. LB $949,284, est. $950,000. central heating plant (Increment No. 2), Naval Air Station, NOy 90984. Spec. 48709, BRUNSWICK, ME. First Naval Dist., 495 Summer St., Boston, Mass. Bids May 4. CD 3/14.

NEW HAMPSHIRE—Dpt. P. Wks. & Hys., State House Annex, Concord.

R. C. Watkins & Son, Inc., Mill Yard, Amesbury, Mass. CA $697,739, est. $700,000, highway and bridges, S-5664 (2), S 223 (1), S-SG273 (6), Andover. Bids Apr. 12. CD 4/17, under LB.

▲† **The Lane Constr. Corp.**, P. O. Box Drawer 911, Meriden, Conn. CA $1,389,252, est. $1,274,424, Barre Falls Dam, Barre, Rutland, Hubbardstown and Oakham. CIVENG-19-016-56-103, MASSACHUSETTS. U. S. Eng., 150 Causeway St., Boston, Mass. CD 5/1, under LB.

▲ **RHODE ISLAND**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence.

M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I., CA $1,774,696, est. $1,700,000. highway work, W. Main Rd., East Main Rd., Turnpike Rd., Bid No. 708, Contr. 5603, FA Proj. F-33 (1), Middletown and Portsmouth; CA $1,096,561, est. $1,100,000, highway work, Kickemuit Rd., Metacom Ave., Ferry Rd. to Mt. Hope Bridge, Bid No. 709, Contr. 5616, Warren and Bristol. Bids Apr. 25. CD 4/27, under LB.

D'Ercole Constr. Co., 552 Union Ave., Providence, R. I., LB $249,907, Contr. 5, LB $306,236, Contr. 4 sanitary sewers, JOHNSTON, R. I. Town, Sanitary Distr. Comm., Town Hall, Johnston, R. I. Bids Apr. 30. CD 4/13.

C. DiMartino & Sons, Inc., 86 Clare Ave., Hyde Park, Mass., LB $880,666, Contr. 5, sanitary sewers Johnston, R. I.

† **Atlantic Gulf & Pacific Co.**, 15 Park Row, New York, N. Y., LB $239,680, est. $214,400, maintenance dredging, Bridgeport Harbor, Bridgeport, CIVENG-19-016-56-133, CONNECTICUT. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 27.

▲† **Bregman Constr. Corp.**, 391 E. 149 St., New York, N. Y., CA $1,025,257, est. $1,017,865, Special AAA Facilities, Ansonia, ENG-19-016-56-91, CONNECTICUT. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 13. CD 4/18, under LB.

Palmer Aarinelli Constr. Co., Inc., 144 Island Brook Ave., Bridgeport, Conn., CA $92,801, water mains, sewers, WATERTOWN, CONN. Town Watertown Fire Dist. Bldg., Watertown, Conn. Bids Apr. 16. CD 4/11.

† **Anderson Fairoaks Constr. Co.**, 145 S. Marshall St., Hartford, Conn.-CA, $598,200. air national guard wing, Bradley Field, ENG-19-016-56-121, WINDSOR LOCKS, CONN. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Apr. 27. CD 5/2, under LB.

BUILDINGS—LB & CA

Viner Brothers, Inc., 304 Hancock St., Bangor, Me., cancelled bids to have been opened Apr. 25, FACTORY, BANGOR, ME. Approx. $100,000. Project abandoned. CD 4/10.

Coleman Constr. Co., Inc., 49 Westminster St., Providence, R. I. CA $554,848, est. $500,000, elementary SCHOOL, north of London St., FALL RIVER, MASS. City, School Dpt., c/o mayor's office, City Hall, Fall River, Mass. CD 4/10, under LB.

City, W. A. Shaughnessy, purch. agt., City Hall, Waltham, Mass., rejected bids Mar. 30, Vocational Trade SCHOOL, Church and Summer Sts., WALTHAM, MASS. Est. $800,000. Will re-advertise. CD 4/6, under LB.

Whit Acres, Inc., John Woods, pres., Enfield, Conn., Owner Builds, $600,000. 49-unit RESIDENTIAL DEVELOPMENT, ENFIELD, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

Pa., Phila.—PARKS—BA 5/22—City, Dpt. Procurement, City Hall Annex, Girard Park, 22nd and Porter Sts., Bid 5307 general constr., Bid 5335 plumbing, Bid 5336 heating, Bid 5337 electric; Kingsessing Recreation Center, 51st and Kingsessing Ave., Bid 5329 general constr., Bid 5330 painting and finishing; Bid 5331 plumbing, Bid 5332 heating, Bid 5333 ventilating, Bid 5334 elec.; Coshocksink Recreation Center, Cedar and Cambria Sts., Bid 5315 general constr., Bid 5316 plumbing, Bid 5317, electrical, Bid 5316, heating, Bid 5328 landscape. Plans deposit $10. CD 2/8/45.

† **Md., Patuxent River**—BA 5/29—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., replacing water tanks Bldg. 507 alterations, installing fire escapes Naval Air Station, NOy 91951. Plans deposit $25.

BUILDINGS—BA

D. C., Wash.—SCHOOL—BA 5/22—D. C. Govt., Dir. Bldg. & Grounds, 499 Pa. Ave. N.W., Garfield Elementary School addn., 25 St. and Alabama Ave. S.E. $427,850. Plans deposit $25. CD 10/15/54.

▲ **N. Y., New York**—SCHOOL—BA 6/6—Director, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, P.S. 175, West 134 and 135 Sts. between Lenox and Seventh Aves., Manhattan Boro. $2,086,400. Plans deposit $25 for general constr., $10 each for plumbing and drainage, heating and ventilating, electrical work and lighting fixtures. CD 1/20/55.

▲ **N. Y., Lewiston**—SCHOOL—BA 6/11—Lewiston-Porter Central School, Lewiston, Junior High School, Youngstown. $1,500,000. Plans deposit $50. Wm. C. Lurkey, 997 Main St., Buffalo, archt. CD 2/20.

† **New York**—ADMINISTRATION—BA *About 7/10*—U. S. Eng., Niagara and Bridge Sts., Buffalo, Zone 7, constr. administration bldg., incl. grading site paving driveways and parking area; constr. sanitary storm sewers, water main and well, St. Lawrence Seaway, Massena, CIVENG-10-023-56-32 (for the St. Lawrence Seaway Development Corp.) Plans deposit $10. CD 9/26.

HEAVY CONSTRUCTION—LB & CA

▲ **Electrical Constructors**, 1758 Cleveland St., Columbus, O., CA $1,253,791, electrical work at Barnhart Island Power Plant, near Massena, St. Lawrence Co., Spec. PA-5-14030, St. Lawrence Contr. No. 25, NEW YORK. The Power Authority of the State of New York, 270 Broadway, New York 7, N. Y. Bids Apr. 10. CD 4/12, under LB.

† **Bregman Constr. Corp.**, 391 E. 149 St., New York 55, N. Y. CA $929,558. constr. addnl. facilities, Syracuse Air Force Station, ENG-30-075-56-145, SYRACUSE, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. CD 4/29, under LB.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton.

Louis Zimmerman, Jr., 278 Hillside Ave., Hillside, N. J., LB $765,499, (7 bidders) bridge, approaches and ramps, U.S. 1 at Amboy Ave. in Edison Twp. Fed. Proj. U-95 (23), Middlesex Co. Bids May 1. CD 4/16.

Thomas Procyer Co., Inc., Long Branch, N. J., CA $365,204. 2,210 ft. section of sea wall south of Gallilee Church property, MONMOUTH BEACH, N. J. Monmouth Beach Borough, Borough Hall, Monmouth Beach; N. J. O. W. Morris, 184 Broadway, Long Branch, boro engr. James Rankin, c/o Bureau of Navigation, ch. engr. Awarded May 1.

Jesse A. Howland & Sons, Inc., Sea Bright, N. J., CA $288,797, 1,407 ft. sea walls, SEA BRIGHT, N. J. Sea Bright Borough Borough Hall, Sea Bright, N. J. James Rankin, c/o Bureau of Navigation, and John P. Weir, 1098 Ocean Ave., Sea Bright, N. J., engrs. Awarded May 2.

City, Dpt. Procurement, City Hall Annex, Phila., Pa. cancelled bids to have been opened May 8, Bid 2549, Contr. S-2146, lining brick sewer in 12th St. from 316 ft. south of Girard Ave. to Richmond St., PHILA., PA. CD 4/18.

† **Wright Contg. Co.**, Odenton, Md. CA $834,261. Northwest branch and Brentwood pumping station, local flood protection and navigation protection Anacostia River Basin, CIVENG 49-080-56-33, MARYLAND and WASH., D. C. U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C. Bids Apr. 24, awarded Apr. 26. CD 4/30, under LB.

▲† **Norair Eng. Corp.**, 1122 22nd St. N.W., Wash. D. C., LB $2,283,000, Item 1; LB $1,998,000, Item 2, (7 bidders) consolidation of steam heating plant, Naval Air Station, PATUXENT RIVER, MD. Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. CD 4/24, under LB.

C. & T. Affiliates, Inc., Collingswood, N. J., LB $114,609, foundations for 4 water tanks, furnishing valve chambers, water mains, appurtenances, WILMINGTON, DEL. 84 Water Comrs., 17 and Market Sts., Wilmington, Del. Bids Apr. 25. CD 4/19.

BUILDINGS—LB & CA

Lotos Lake Homes, c/o Nassau Home Sales Realty Co., 1 N. Merrick Ave., Merrick, N. Y. Owner Builds $840,000. 70 HOUSES on 40 acre tract at McConnell Ave. and Lotos Rd., BAYPORT, N. Y.

Bay Country Estates, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds $660,000. 60 HOUSES on tract on north side of Montauk Hy., BELLPORT, N. Y.

Barr, Gleason & Barr, Inc., 501 Fifth Ave., New York 17, N. Y. CA Est. $750,000. RELIGIOUS EDUCATION and CONGREGATION HALL addns. to church, BRONXVILLE, N. Y. The Reformed Church of Bronxville, Pondfield Rd., Bronxville, N. Y.; Eggers & Higgins, 100 E. 42 St., New York 17, N. Y., archts.

▲ **Viking Homes**, c/o Albert B. Meklenburg, Org., 1010 Northern Blvd., Roslyn, N. Y. Owner Builds $1,000,000. 64 HOUSES on tract at 122 St. and 25 Ave. COLLEGE POINT, N. Y.

▲ **Pine Crest Homes**, c/o Kern Realty Co., 124-26 Queens Blvd., Kew Gardens, N. Y. Owner Builds $3,750,000 300 HOUSES on 20 acre tract on Hospital Rd. north of Patchogue-Yaphank Rd., EAST PATCHOGUE, N. Y.

▲ **George A. Fuller Co.**, 562 Madison Ave., New York 22, N. Y. CA Est. $2,000,000. 24 story OFFICE alterations, 80-88 John St., NEW YORK, N. Y. Travelers Insurance Co., 80-88 John St., New York 17, N. Y.; Edward E. Ashley, 10 E. 40 St., New York 17, N. Y., engr.

William L. Crow Constr. Co., 101 Park Ave., New York 17, N. Y. CA branch OFFICE and VAULT, 415 Madison Ave., NEW YORK, N. Y. Bankers Trust Co., 16 Wall St., New York 5, N. Y. Shreve, Lamb & Harmon, 11 E. 44 St., New York 17, N. Y., archts.

▲ **Rolling Ridge Homes**, c/o Alwin Cassens Sr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds $2,750,000. 210 HOUSES on tract overlooking Northport Harbor, NORTHPORT, N. Y.

(Continued on page 140)

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

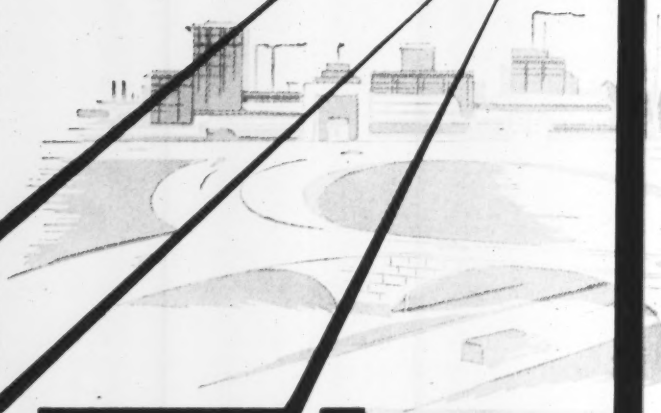
†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

Heltzel Portable Batchmaster

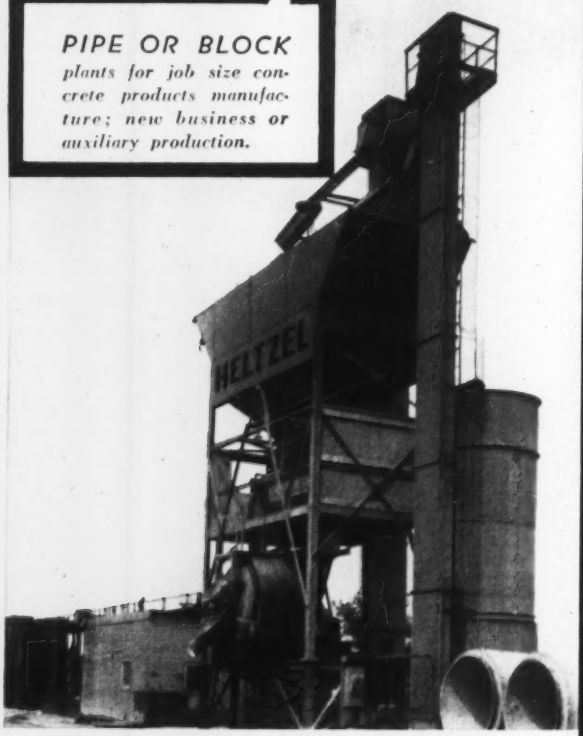
Every

JOB SITE *combination plants, designed to give you every batching advantage at the job location. They will cut truck time and wear enough to pay for themselves.*



READY-MIX *plants ideal for decentralization —spotting at new housing developments, etc.*

PIPE OR BLOCK *plants for job size concrete products manufacture; new business or auxiliary production.*



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Don't buy any plant until you have talked with the owner of one of these new Batchmasters, for true portability is but one of many new features that make the Heltzel 1956 Line the fastest, most accurate and flexible plants on the market. And remember Batchmasters cost no more—so why not operate with the finest.

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(Continued from page 137)

▲ **Colonial Oaks Homes,** c/o Par-Sen Realty Corp., 70 W. Montauk Hy., Lindenhurst, N. Y. Owner Builds. $3,900,000. 300 HOUSES on 100 acre tract at Maple Ave. and Rte. 111, SMITHTOWN, N. Y.

Cherrywood at Wantagh Homes, c/o Trylon Realty Co., 98-89 Queens Blvd., Forest Hills, N. Y. Owner Builds. $700,000. 35 HOUSES on tract on Wantagh Ave. south of Southern State Parkway, WANTAGH, N. Y.

John Ingannamort, 227 DeLong Ave., Dumont, N. J., Owner Builds, $600,000 30 HOUSES, Knickerbocker Rd., DUMONT, N. J. Stanley A. Leeks, 50 Margaret Court, Dumont, N. J., archt.

▲ **M. O. Hull, Sr. & M. T. Hull, Jr.,** Monroe St., Union, N. J., CA, $1,000,000. 1 story, 120,000 sq. ft. PLANT to mfg. valves and electromagnetic controls, FLEMINGTON, N. J. Automatic Switch Co., 391 Lakeside Ave., Orange, N. J. H. L. McMurray, 983 Stuyvesant St., Union N. J., archt.

▲ **General Electric Co.,** River Rd., Schenectady, N. Y. CA Est. $50,000,000. 325,000 kw. TURBINE GENERATOR, 2nd unit Eddystone Power Plant, PHILA., PA., Philadelphia Electric Co., 1000 Chestnut St., Philadelphia, Pa. CD 9/9/54.

▲† **John McShain, Inc.,** 1501 N. Arlington Ridge Rd., Arlington, Va., LB $7,647,000. (13 bidders) AEC HEADQUARTERS, GERMANTOWN, MD. Atomic Energy Comm., 1717 H St. N. W., Wash., D. C. Bids May 3. CD 4/3.

SOUTH

HEAVY CONSTRUCTION—BA

† **Virginia**—RADIO DIRECTION FINDER FACILITY—BA 5/22—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Zone 11, radio direction finder facility, Naval Radio Station (R), Northwest, NOy 91323, Spec. 48262. Plans deposit $55.

† **Va., Norfolk**—LIGHTING—BA 5/22—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Zone 11, Lighting modifications, Naval Station, Naval Base, NBy 666, Spec. 666/56. Plans deposit $25.

† **Va., Quantico**—GAS LINES—BA 5/23—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., replacement of post gas lines, Marine Corps Schools, NOy 93300. Plans deposit $25. CD 3/29/55, under Public Buildings.

Fla., Tampa—BA 5/24—Bd. Representatives, City Hall, Div. XE23, 14,800 lin. ft. 8 in. vitr. clay sewers; Div. XE24, 35,070 lin. ft. 8- to 12-in. vitr. clay sewers; Div. XE25, 24,570 lin. ft. 8 in. vitr. clay sewers; Div. XE26, 68,350 lin. ft. 8- to 15-in. vitr. clay sewers. Plans deposit $25. Greeley & Hansen, 220 S. State St., Chicago 4, Ill., engrs.; adv. ENR 5/17.

† **Fla., Tallahassee**—PARKING AREA, etc.—BA 5/29—P. Wks. Office, Sixth Naval Dist., Bldg. 12, Charleston, S. C., parking area and service utilities, Naval Reserve Electronic Facility.

† **West Virginia, Kentucky, and Ohio**—BA On Or About 5/31—U. S. Eng., 237 4 Ave., Huntington, W. Va., floodwall remedial work Parkersburg and Point Pleasant, W. Va. and piezometer tube work in Parkersburg, Point Pleasant, Huntington and Ceredo-Kenova, W. Va.; Ashland and Maysville, Ky.; Ironton and Portsmouth, O., CIVENG-46-022-56-61.

† **N. C., Wilmington**—CEMETERY IMPRVS.—BA 6/6—U. S. Eng., 308 Customhouse, Wilmington National Cemetery Imprvs., ENG-31-075-56-59. Plans deposit $1.60.

† **N. C., Fort Bragg**—STILLING BASIN—BA 6/7—U. S. Eng., 308 Customhouse, Wilmington, constr. stilling basin, Pope Air Force Base, ENG-31-075-56-64. CD 9/16.

† **Fla., Orlando**—THEATER, etc.—BA On Or About 6/14—U. S. Eng., P.O. Box 4970, Jacksonville, Zone 1, theater and bath house alterations, Pinecastle Air Force Base, ENG-08-123-56-64. CD 1/31/51.

BUILDINGS—BA

Va., Norfolk—SCHOOL—BA 5/24—Norfolk City School Bd., Bank and Charlotte Sts., 1 story, steel, Lansdale Elementary School. $650,000. Plans deposit $50. John A. Simpson, McKevitt Bldg., archt.

† **Fla., Miami**—TRAINING CENTER—BA 5/29—Dist. P. Wks., Sixth Naval Dist., Charleston, S. C., Marine Corps Reserve Training Center, NOy 94271, Spec. 50758. Plans deposit $30.

HEAVY CONSTRUCTION—SLC

▲ **Va., Norfolk**—Norfolk & Portsmouth Belt Line R.R. Co., C. M. Bell, ch. engr., Union Depot, soon lets contract Unit II and III superstructure Belt Line Bridge over Southern Branch, Elizabeth River, single track, 387 ft. draw span, 143 ft. lift, steel structure. $2,000,000. Harrington & Cortelyou, Ohio St., Norfolk, engrs.

HEAVY CONSTRUCTION—LB & CA

VIRGINIA—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond, received no bids May 2, pier replacement, Bridge over Occoquan Creek, Rte. 1, State Proj. 1629-09, Fairfax and Prince William Counties. CD 4/17.

VIRGINIA—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond, cancelled bids to have been opened May 2, soil aggregate base, bit. surf. tr. 1.72 mi. Rte. 49 from 1.72 mi. south of WCL Chase City to WCL Chase City, State Proj. 3458-06-07-11. Fed. Proj. S-693 (2), Mecklenburg Co. CD 4/17.

VIRGINIA—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond,

B. G. Young & Sons, Box 333, Johnson City, Tenn., LB $647,408 (7 bidders) b. conc. base, bit. top 5.93 mi. Rte. 58 from bridge over Chestnut Creek to bridge over Crooked Creek, State Proj. 1717-02-05-70, Fed. Proj. F024-1 (2); U114-1 (1), Carroll Co. Bids May 2. CD 4/17.

† **John McShain, Inc.,** 1501 N. Arlington Ridge Rd., Arlington, Va., CA $514,000, est. $580,000 rehabilitation national cemetery, incl. memorial amphitheater, Arlington National Cemetery, ARLINGTON, VA. Dpt. of the Army, The Pentagon, Wash., D. C. Eggers & Higgins, 100 E. 42 St., New York, N. Y. archts. Awarded Apr. 4.

† **Better Builders, Inc.,** 8475 Chesapeake St., Norfolk, Va., CA $555,981, 1 story brick, concrete masonry INFIRMARY, Naval Air Station, NOy 91316, Spec. 48258, CHINCOTEAGUE, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Apr. 17. CD 4/23, under LB.

▲† **Diamond Constr. Co.,** Ocean Steamship Terminal, Savannah, Ga. CA $3,094,487, Pier 12 and facilities, Naval Base, NOy 89504, Spec. 47351. NORFOLK, VA. Dist. P. Wks. office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Apr. 24. CD 4/27, under LB.

▲† **McLean Contg. Co.,** 2405 Kimball Terrace, Norfolk, Va., CA $2,169,717, bulkhead, breakwater for new pier, Norfolk Naval Base, NOy 91412, Spec. 48316, NORFOLK, VA. P. Wks. office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bid Apr. 12. CD 4/24, under LB.

WEST VIRGINIA—State Hy. Comn., Charleston,

W. Va.—**Andersons', Inc.,** & W. Va. Black Rock Co., 8 Spring St., Charleston, W. Va., LB $149,742 wid'n., b. conc. 5 mi. Proj. 3009-B and 3067, Wirt Co.,

W. Va.—**F. F. Earp,** Box 589, Fairmont, W. Va., LB $148,796, traffic bound base, b. conc. 1.368 mi. Proj. F-285 (4), Randolph Co. Bids May 1. CD 4/20.

WEST VIRGINIA—State Rd. Comn., Charleston,

W. Va.—**Pocahontas Constr. Co.,** Marlinton, W. Va., LB $83,638, Contract No. 3, Coopers Bridge 2020 over Bluestone River, S-647 (1) Mercer Co.;

W. Va.—**Harman Bros.,** Box 475, Grafton, W. Va., LB $171,568, traffic bound base, b. conc. bottom and wearing courses and bridge 0.076 mi. Jessop Overhead and approaches, FG-166 (6), Preston Co.;

W. Va.—**W. R. Orders & Son,** St. Albans, W. Va., LB $88,987, Contract 1, Winfield Overhead Bridge 2019 over W. Va. Rt. 17, S 242 (10), Putnam Co. Bids May 1. CD 4/20.

† **T. A. Loving & Co.,** Bank of Wayne Bldg., Goldsboro, N. C., LB $815,945 (4 bidders) radar air traffic control center, Marine Corps Air Station, NOy 85868, Spec. 43054, CHERRY POINT, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 8. CD 5/1.

C. W. Gallant, Inc., 206 Latta Arcade, Charlotte, N. C., LB $840,134. Cont. 33, sewage treatment plant imprvs., Third Fork Plant, DURHAM, N. C. City, R. W. Flack, city mgr., Durham, N. C. Bids May 1. CD 4/19.

† **Dickerson, Inc.,** Monroe, N. C., LB $164,850. (4 bidders) chapel, Marine Corps Air Facility, New River NOy 91359, Spec. 48286, JACKSONVILLE, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 1.

† **T. A. Loving & Co.,** Bank of Wayne Bldg., Goldsboro, N. C., LB $187,953 (4 bidders) Navy Supply Warehouse, U. S. Marine Corps Air Facility, New River, NOy 91336, Spec. 48270, JACKSONVILLE, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 1. CD 4/5.

† **T. A. Loving & Co.,** Bank of Wayne Bldg., Goldsboro, N. C., LB $86,900, outdoor recreation facilities, Marine Corps Air Facility, New River, NOy 91362, Spec. 48289, JACKSONVILLE, N. C. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 8. CD 4/13.

† **Arundel Corp.,** Pier 2, Pratt St., Baltimore, Md. CA $579,342, maintenance dredging, Charleston Harbor, Charleston Co., No. 38-081-56-14, SOUTH CAROLINA. U. S. Eng., Custom House, Charleston, S. C. Bids Apr. 19. CD 4/24, under LB.

† **M. O. Seckinger Co.,** 412 Whitaker St., Savannah, Ga. CA $628,297, steam distr. sys. alterations, Marine Corps Recruit Depot, NOy 91119. PARRIS ISLAND, S. C. P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, S. C. Bids Apr. 26. CD 5/3, under LB.

▲ **GEORGIA**—State Hy. Dpt., General Office No. 2 Capitol Sq., Atlanta,

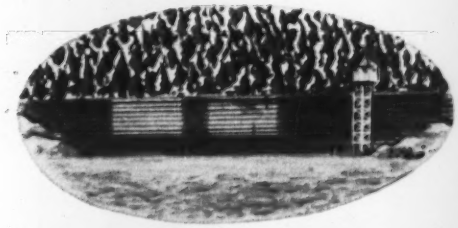
Ga.—**R. G. Foster & Co.,** Wadley, Ga., LB $208,672 (12 bidders) resurf. 9.59 mi. Waycross-Baxley Rd., State Rte. 4, F-002-1 (9) Bacon Co.; LB $90,686 (5 bidders) resurf. 5.02 mi. Macon-Jackson Rd., State Rte. 87 F-307-1 Monroe Co.; LB $863,048 (8 bidders) reconstr., wid'n., grading, paving 1 bridge 3.994 mi. Augusta-Ga-Milledge Rd. F-048-1 (2), Richmond Co.;

Ga.—**Shepherd Constr. Co., Inc.,** 1800 Briarcliff Rd. N. E., Atlanta, Ga., LB $200,956 (8 bidders) resurf. 6.506 mi. Turtle River Causeway State Rtes. 50 and 25 Spur, F-007-4 (2) and F-009-2 (13) Glynn Co.;

Ga.—**Claussen-Lawrence Constr. Co.,** 1394 Gwinnett St., Augusta, Ga., LB $858,667 (10 bidders) wid'n., resurf., reconstr. bridge 20.517 mi. Baxley-Jesup Rd., State Rte. 27, F-008-1 (4), Appling and Wayne Counties;

Ga.—**Hugh McMath Constr. Co.,** Brennan Rd., Columbus, Ga., LB $2,121,862 (16 bidders) grading, paving 4.953 mi., 6 overhead double bridges, 5 underpass

(Continued on page 143)



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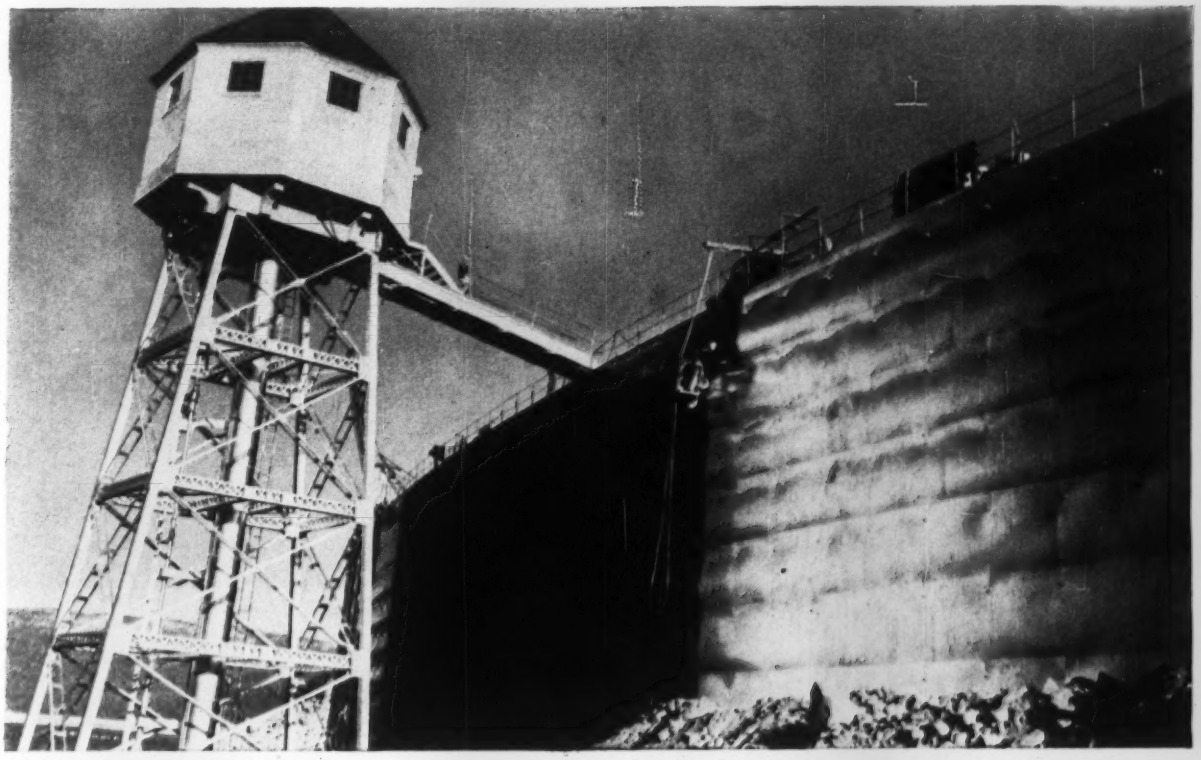

THE Huntington Lake power dams in Central California have performed yeoman service since their construction in 1917. But 38 winters in the High Sierra is a long time . . . long enough for the annual freezing and thawing cycles to react on the concrete surfaces of the dams' faces. Southern California Edison Company therefore took important maintenance measures last summer.

To provide maximum protection against corrosion, welded steel plates—behind which was poured a six-inch minimum thickness of concrete—were installed on the upstream faces of the two dams. The steel plates were then sandblasted and given a protective coating of Pitt Chem "Tarset," the new coal tar-epoxy resin coating.

Tarset, the toughest, hardest coating of its kind ever developed from coal tar, is being called upon to solve all sorts of corrosion problems formerly classified as "impossible." Tests show that Pitt Chem Tarset can stop corrosion caused by atmospheric exposure . . . sour crude petroleum and petroleum products . . . salts and acids. And it actually becomes harder at temperatures as high as 400°F!

What can Tarset do for you? Outline your corrosion problem—either by phone or letter—and we'll gladly help you solve it.

Send for Descriptive Booklet on TARSET today

Free booklet tells how to use amazing new Tarset to reduce costly corrosion. Gives detailed description of Tarset's specifications, properties and application characteristics. Write for *your* copy today!

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No more broken plows on this boulder . . .

New Michigan Turbo-Dozer roots out buried 2-ton boulder

When these pictures were taken, the 2¾-yd. Michigan Turbo-Dozer had just finished clearing some wooded farmland to open up more acreage for cultivation. The farmer asked the Turbo-Dozer operator if he'd try to remove a certain boulder which lay completely buried in the wet loam—he'd broken two plow blades on it. This job—which took the Turbo-Dozer 5 minutes—illustrates what you can do with the Michigan's exclusive power-tilting bowl.

Compare this photo with the large picture. Here the boulder has been brought up to the surface, and the operator has tilted the bowl forward to "float" position to carry it away.

Cut and pry with bowl

Two lateral cuts on the front and back sides of the boulder exposed approximately six inches of stone. Then, crowding in against it, the operator hooked the cutting-edge of the bowl under a projection on the stone—and worked the bowl back and forth through a 33 degree arc to pry it loose. When the boulder loosened, he crowded forward as he raised the bowl—literally *lifted* and pushed the boulder out of its hole.

Full power on all wheels

In addition to its power-tilting bowl, the new Turbo-Dozer features rear-wheel steering: even on turns, *you maintain full power on all four wheels*, except when you declutch the rear axle for highway travel. The 165 hp turbo-charged diesel engine drives through 3-to-1 torque converter, power-shift transmission and planetary-wheel drive axles. This power-train is standard equipment on the Turbo-Dozer: four speeds forward and reverse, top speed 27 mph.

20-page photo booklet

You'll find a full description of the power-tilting bowl, C-frame, power-train and specifications in a 20-page photo booklet—write for a copy. The new Turbo-Dozer combines rubber-tired speed with outstanding traction and power—28,000 lbs. maximum rim-pull, on 18.00-25 low pressure tires or optional 23.5-25. For faster cycles, more yardage or tonnage in every shift, take a look at the new Michigan Turbo-Dozer.

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2401 Pipestone Road
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CLARK® EQUIPMENT

(Continued from page 140)

bridges relocation of Adel-Ashburn Rd., IN-401-1 (2), Contract 1, Tift Co.;

Ga.—**H. G. Smith**, Fitzgerald, Ga., LB $997,148 (16 bidders) grading, paving 4.953 mi., 6 overhead double bridges, 5 underpass bridges, relocation of Adel-Ashburn Rd., IN-401-1 (2), Contract No. 2, Tift Co.;

Ga.—**E. A. Hudson's Sons**, Bolton, Ga., LB $186,590 (5 bidders) grading, paving 4.97 mi. Kingston-Adairsville FAS Route 829, S-0829 (1), Bartow Co.;

Ga.—**E. F. Groover**, Moultrie, Ga., LB $209,696 (12 bidders) grading, paving 7.88 mi. Tifton-Whiddon Mill Rd. FAS Route 1179, S-1179 (1), Tift Co.;

Ga.—**G. L. Strickler**, Austell, Ga., LB $178,680 (8 bidders) grading, paving, 1 bridge 7.715 mi. Newborn-Hub Rd., State Rte. 229, S-1702 (1), Newton Co.;

Ga.—**Coffee Constr. Co.**, Eastman, Ga., LB $276,834 (8 bidders) paving, grading 9.781 mi. Manor-Millwood Rd., FAS 1709, S-1709 (1) Ware Co. Bids May 4. CD 4/27.

▲ **FLORIDA**—State Road Dpt., Tallahassee,

Fla.—**Julian E. Johnson Contr. Co.**, 628 Florence St., Jacksonville 5, Fla., LB $117,279 (3 bidders) 17.017 mi. roads and streets, Jobs 7288-151 and 7288-154, Duval Co.; LB $147,644 (3 bidders) surf. 23.743 mi. roads and streets, Jobs 7288-151 and 7288-152 and 7288-153, Duval Co.;

Fla.—**Dunn Constr. Co., Inc.**, 2508 3 Ave. N., Birmingham, Ala., LB $113,201 (8 bidders), base, surf. b. conc. 12.583 mi. SR 15, Job 7601-116, Putnam Co.; LB $122,956 (5 bidders) b. conc. 17.337 mi. SR 35, Job 1603-117, Polk Co.;

Fla.—**R. H. Strickland**, Quincy, Fla., LB $91,871 (4 bidders), base, surf. 5.012 mi. SR S-268, Job 5062-150, Gadsden Co.;

Fla.—**J. D. Manly Constr. Co.**, Box 586, Leesburg, Fla., LB $249,742 (8 bidders), limerock base, surf., 75 ft. concrete slab deck bridge, 7.385 mi. SR S-565 Job 1160-150 Lake Co.;

Fla.—**Brinson Constr. Co.**, Box 2209, Tampa, Fla., LB $92,115, (5 bidders) embankment 1.768 mi. SR 55, Jobs 131-188 and 1517-189 Manatee and Pinellas Counties;

Fla.—**San Marco Contr. Co.**, Box 1361, St. Augustine, Fla. LB $236,112, (6 bidders) limerock base, surf. concrete box culverts 6.583 mi. SR 54, Job 1409-150, Pasco Co.;

Fla.—**J. W. Conner & Sons, Inc.**, Box 2522, Tampa, Fla. LB $181,048, (4 bidders) limerock base, b. conc., 2.907 mi. SR 45, Job 0701-116 and 08-01-114, Citrus and Hernando Counties;

Fla.—**Jas. H. Craggs Constr. Co.**, Box 22, Gainesville, Fla., LB $745,718, (5 bidders) limerock base, surf., concrete box culverts 14.54 mi. SR 207, Job 7805-176, St. Johns Co.;

Fla.—**Hubbard Constr. Co.**, Box 7217, Orlando, Fla., LB $72,918, (3 bidders) base widen strips, b. conc. 5.827 mi. SR 435, Job 7507-102, Orange Co.;

Fla.—**Central Florida Constr. Co.**, Box 242, Miami 48, Fla., LB $505,334, (4 bidders) maintenance traffic, excav., limerock base with surf., b. conc., resurf. existing pavement with b. conc., 2 multiple box culverts, drainage structures 10.051 mi. SR 45, F-012-1 (5), Jobs 1201-203 and 1201-119, Lee Co.;

Fla.—**E. E. Collins Contr. Co.**, 2175 S.W. 32 Ave., Miami 34, Fla., LB $416,456, (3 bidders) grading, base with surf., b. conc., widen 6 bridges, 6.662 mi. SR 90, F-012-2 (5), Job 0304-203, Collier Co.;

Fla.—**R. H. Wright & Son**, Box 781, Ft. Lauderdale, Fla., LB $1,218,885, (6 bidders) maintenance traffic, excav., base with b. conc., 106 ft. bridge, 160.54 ft. bridge, storm sewers 3.077 mi. SR 7, US-12 (4), Job 8714-203, Dade Co.;

Fla.—**Coggin & Deermont**, Chipley, Fla., LB $308,405, (3 bidders) excav., SBRM, 444.5 ft. bridge 0.444 mi. SR 10, FG-017-2 (7), Job 5101-303, Gulf Co.;

Fla.—**A. F. Rich**, P. O. Box 149, Tallahassee, Fla., LB $110,307, (2 bidders) base with surf., 1 box culvert, drainage structures 4.672 mi. SR S-364, S-424 (1), Job 5562-250, Leon Co. Bids May 3. CD 4/23.

▲ **FLORIDA**—State Road Dpt., Tallahassee,

H. E. Wolfe Constr. Co., Box 1361, St. Augustine, Fla., CA, $1,871,093, c. conc. and asph., 545 ft. concrete, steel overpass bridge over Seaboard Air Line R.R., storm sewers 3.42 mi. SR 5/5, US-219 (5) and US-219 (6), Jobs 1501-302 and 1501-202, Pinellas Co. Bids Dec. 6, awarded Apr. 27. CD 12/9, under LB.

▲ **FLORIDA**—State Road Dpt., Tallahassee,

Industrial Constr. Co., Box 2307, Ft. Lauderdale, Fla., LB $1,224,173, 1,095.25 ft. bridge over Intracoastal Waterway and approaches, two 23 ft. roadways, and two 5 ft. sidewalks, composed of thirteen prestressed concrete girder spans 63 ft. long, two I-beam and concrete deck spans 64 ft., 113½ in. long an electrically operated double-leaf bascule span 146 ft., 3½ in. long; on concrete piers and concrete pile bents, grading, limerock base with b. conc. storm sewers 0.458 mi. SR A-1-A on Las Olas Blvd. in Fort Lauderdale, Job 8605-112, Broward Co. Bids May 3. CD 4/4.

Lowry Electric Co., Inc., 300 Bird Rd., Coral Gables, Fla., CA, $76,050, Item No. 3, street lights along South Dixie Hy. between Red Rd. and Brooker St., CORAL GABLES, FLA. City, City Hall, 405 Biltmore Way, Coral Gables, Fla.

ALABAMA—State Hy. Dpt., Montgomery,

Laidlaw Contr. Co., Wolf Ridge Rd., Mobile, Ala., LB $168,839 overpass over T. & N. R.R. on U. S. 43 near Saraland, Mobile Co. Bids Apr. 27. CD 4/17.

▲ **ALABAMA**—State Hy. Dpt., Montgomery,

Ala.—**M. A. Evans Constr. Co.**, Wetumpka, Ala., LB $213,929, grading, draining 9.471 mi. Calhoun and Talladega Counties; LB $206,294, bit. 2.555 mi. Florence-Killen Rd., Lauderdale Co.;

Ala.—**McDowell & McDowell**, 718 Murfreesboro Rd., Nashville, Tenn., LB $191,750, grading, draining 4.615 mi. St. Clair Co.;

Ala.—**Sam Finley Inc.**, 292 North Ave. N. W., Atlanta, Ga., LB $88,357, plant mix 13.394 mi. Sumter Co.;

Ala.—**Green Constr. Co.**, Union Springs, Ala., LB $78,303, base, bit. 9.496 mi. Geneva Co.;

Ala.—**Tuscaloosa Constr. Co.**, 3006 9 St. Tuscaloosa, Ala., LB $146,147, bit. 9.002 mi. Nettleboro-Chance Rd., Clarke Co.;

Ala.—**Alvin J. Hazelrig, Jr.**, Clegeland, Ala., LB $84,286, grading, draining 10.542 mi. Colliman Co.;

Ala.—**J. & H. Excavating Co.**, 901 22 Ave., Tuscaloosa, Ala., LB $144,295, grading, drainage 10.25 mi. County Lake Rd., Fayette Co.;

Ala.—**J. R. Bryant Constr. Co.**, 121 Moulton St., Montgomery, Ala., LB $128,441, base, and bit. 21.952 mi. 6 county roads, Marengo Co.;

Ala.—**Bowyer & Johnson Constr. Co.**, Jackson, Tenn., LB $189,711, Proposal A, maint. resurf. 123.51 mi. Franklin, Marion and Winston Counties;

Ala.—**Famrer Constr. Co., Inc.**, 2152 Halls Mill Rd., Mobile, Ala., LB $80,110, bit. 3.949 mi. Mobile Co. Bids Apr. 27. CD 4/17.

▲ **ALABAMA**—State Hy. Dpt., Montgomery,

Ala.—**McDowell & McDowell**, 718 Murfreesboro Rd., Nashville, Tenn., CA $962,410 Proposal "A" bit. 7.764 mi. Pickins and Tuscaloosa Counties;

Ala.—**Laidlaw Contg. Co.**, Wolf Ridge Rd., Mobile, Ala., CA $877,285, Proposal "A", bit. 6.544 mi. Mobile Co.;

Ala.—**Hardaway Contr. Co.**, 15 E. 11 St., Columbus, Ga., LB $758,912 bit. 4.255 mi. Calhoun Co. Bids Apr. 6, awarded Apr. 30. Grand total $2,598,607. CD 4/18, under LB.

▲ **T. L. James & Co., Inc.**, Ruston, La., CA, $1,448,246, paving unpaved streets in Northern Section, MOBILE, ALA. City, City Hall, Mobile, Ala. Bids Apr. 17, awarded Apr. 24. CD 3/13.

† **Brown-Coble Constr. Co.**, Lexington, N. C., CA $550,511 East-West Runway exten., Donnelly Field, MONTGOMERY, ALA. U. S. Eng., 2301 Grand St., Mobile 7, Ala. Bids Apr. 26, awarded Apr. 30. CD 5/1, under LB.

† **U. S. Eng.**, 2301 Grant St., Mobile 7, Ala., cancelled bids to have been opened Apr. 10, aircraft control and warning system, ENG-01-076-56-63, CRYSTAL SPRINGS, MISS. CD 3/19.

▲ **Roland Constr. Co.**, Box 850, Alexandria, La., CA $754,884, Proj. No. 1, $456,537, Proj. No. 2, two storm drainage proj. Proj. 1456-1 and 1456-2, ALEXANDRIA, LA. Gravity Drainage Dist. No. 1, Alexandria, La. Bids Apr. 10, awarded May 2, CD 4/18, under LB.

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Main Span 120 Feet
With 50' End Approaches

Load: 54 Ton

Chords, Web Members and Stringers By RILCO

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BUILDINGS—LB & CA

A & P Constr. Co., 419 W. 22 St., Norfolk, Va., LB $515,141, Washington District Elementary SCHOOL, NORFOLK, VA. Norfolk County School Bd., 148 Granby St., Norfolk, Va. J. Binford Walford & O. Pendleton Wright, 103 E. Cary St., Richmond, Va., archts.

† **Hanover Constr. Co., Inc.**, 3908 Bainbridge Blvd., South Norfolk, Va. LB $196,292 (6 bidders); modernization of cold storage bldg., Naval Supply Center, NOy 91294, Spec. 47380, NORFOLK, VA. Dist. P. Mvs. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids May 1. CD 4/4.

▲ **Robert H. Pinnix**, Gastonia, N. C., CA $1,038,293. CREAMERY PLANT, ASHEVILLE, N. C. Biltmore Dairy Farms, Biltmore, N. C. Bids Apr. 24. CD 5/3, under LB.

† **L. P. Cox Co.**, Sanford, N. C., LB $544,650. 37,000 sq. ft. Murray SCHOOL, N. C. 56-C, Fed. 1AG, FORT BRAGG, N. C. Housing & Home Finance Agency, 1626 "K" St. N. W., Wash. 25, D. C. Bids Apr. 27. CD 4/20.

Charleston Constructors, Inc., N. Adgers Wharf, Charleston, S. C., LB $570,144. Columbus Street SCHOOL, CHARLESTON, S. C. Bd. Trustees School Dist. 20, Charleston, S. C. Bids May 1. CD 4/17.

▲ **Blaw Knox Co.**, Chemical Plants Div., P. O. Box 778, Pittsburgh, Pa., CA $7,500,000. design and construct, PLANT to produce chlorine and caustic soda, MC-INTOSH, ALA. Olin Mathieson Chemical Corp., Mathieson Bldg., Baltimore, Md.

▲ **Ebasco Services, Inc.**, 2 Rector St., New York, N. Y., CA Total est. $25,000,000. design and construct addn. to double capacity of Rex Brown POWER STATION, JACKSON, MISS. Mississippi Power & Light Co., Lampton Bldg., Jackson 5, Miss.

Gilson Constr. Co., 751 E. Third St., Lexington, Ky. LB $569,000. (8 bidders) County HIGH SCHOOL, near NICHOLASVILLE, KY. Jessamine Co. Fiscal Court, Nicholasville, Ky. Brock & Johnson, 159 Barr St., Lexington, Ky., archts. Bids Apr. 24. CD 5/9/51.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

† **Wis., Madison**—STORAGE BINS—BA 5/23—Procurement Office, Bldg. 600, Truax Field, Madison; storage bins, in base salvage yard, Truax Field, I.F.B. 46-602-56-46. CD 6/27/51.

O., **Cincinnati**—BA 5/22—Bd. Comrs. Hamilton Co., Court House, 8 in. c.i. water line, State Rd., $62,421; 8 in. c.i. water lines, Muddy Creek Rd., Johnson Rd., Paddison Rd. $54,853. Geo. Lemmel, co. engr.

Mich., Manchester—BA 5/24—Village, L. A. Marx, clk., Manchester, Contr. 1, 11,000 ft. interceptor sanitary sewers and pumping main; Contr. 2, sewage treatment plant and sewage pumping station. Est. $300,000. Contrs. 1 and 2. Plans deposit $15 each. McNamee, Porter & Seeley, 306 State Savings Bank Bldg., Ann Arbor, engrs. CD 3/13.

▲ **Mich., Port Huron**—BA 5/25—City, Robert E. Kranke, actg. city clk., Port Huron, double leaf bascule bridge and approaches over Black River, Tenth St. $1,400,000. Plans deposit $25. Hazelet & Erdal, 53 W. Jackson Blvd., Chicago 4, Ill., engrs. CD 12/19.

† **Wis., Madison**—CENTRAL HEATING SYSTEM—BA 5/29—U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. central heating sys., Truax Field, ENG-11-032-56-65. CD 6/27/51.

O., **Akron**—BA 6/1—Comrs. Summit Co., Court House, improv. Chamberlin Rd. by constr. sectional corrugated metal structure and drainage ditch on S. R. 82, Twinsburg Village. Plans deposit $5.

BUILDINGS—BA

Ill., Aurora—SCHOOL—BA 5/23—Bd. Educ. School Dist. 129, 152 Glenwood St., constr. Elmwood Dr. Grade School, $450,000. Gray, Laz & Mall, 909 S. Batavia St., Geneva, archts. CD 1/5.

▲ **Ill., West Aurora (Aurora P. O.)**—SCHOOL—BA 5/23—School Dist. of West Aurora, West Aurora, brick, concrete Junior High School $1,000,000. Berger-Kelley & Assocs., 44 Main St., Champaign, archts.

O., **Cincinnati**—HIGH SCHOOL—BA 5/23—Southwest Local School Dist., Harrison, high school, West and Dry Forks Rds., elementary school addn., New Haven Rd. $944,000. Plans deposit $25. Extended date. Rosendahl & Brown, 3426 Edwards Rd., archts.-engrs. CD 4/5.

Ind., Lafayette—SERVICE CENTER, etc.—BA 5/24—Bd. Trustees Purdue University, West Lafayette, food service center, student dormitory courts Purdue University Sheep Barn, Purdue University Cattle Barn. Plans deposit $25. Walter Schuler & Assoc., 1114 State St., Lafayette, Ind., archts. for food service center.

Ill., Decatur—BA 6/1—SCHOOL—Decatur School Dist. Bd. Educ., Decatur, brick, concrete elementary school $400,000. Berger-Kelley & Assocs., 44 Main St., Champaign, archts.

▲ O., **Cleveland**—OUT PATIENT—BA 6/14—City, Dpt. Health & Welfare, Bell Greve, dir., City Hall, Zone 14, erecting out patient bldg., City Hospital $4,471,854. Plans deposit $100. Small, Smith, Reeb & Draz, 1010 Euclid Ave., Zone 15, archts. CD 10/25, under LB.

▲ **Wis., Milwaukee**—SCHOOL—BA 6/14—Bd. School Directors, 1111 N. 10 St., West Division High School $3,670,000. Plans deposit $150. M. Meyer & Assocs., 424 E. Wells St., Milwaukee, engrs.-archts. CD 4/12.

† O., **Dayton**—RECREATION-THEATER BLDG.—BA 6/26—Veterans Admin., Munitions Bldg., Wash., D. C., Recreation and Theater Bldg. No. 305, Veterans Admin. Center. CD 3/15.

O., **Cleveland**—HEADQUARTERS—BA 7/21—Cleveland Community Chest, 1001 Huron Rd., Zone 15, permanent headquarters bldg., Euclid Ave. near E. 30 St. $500,000. Weinberg & Teare, Citizens Bldg., Zone 14, archts. CD 2/7.

BUILDINGS—SLC

Mich., Grand Rapids—STORAGE, etc.—American Box & Board Co., 470 Market St. S. W., soon lets contract 2 story bsmt., 52x135 ft. storage and office bldg., Prospect Ave. and Fulton St. $310,000. Giffels & Vallet, Inc., 1000 Marquette Bldg., Detroit, Zone 26, archt.-engr. Rindge & Rindge, 240 Michigan Trust Bldg., engrs. CD 1/23.

▲ **Mich., Plymouth**—PLANT—Burroughs Corp., 6071 Second St., Detroit Zone 2, soon lets contract, 200,000 sq. ft. plant. $3,500,000. Marr & Marr, 415 Brainard St., Detroit, Zone 2, archts. CD 3/26.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15.

O.—**Glenn Rhoades Constr. Co.**, Mt. Orab, O., LB $158,467, est. $173,800, (3 bidders) Type T-35 on B-119 and structure 0.805 mi. USR 68-(29.57) (35.11) (37.61), F-644 (5), Brown Co.;

O.—**Walter L. Follmer**, P. O. Box 173, Hamilton, O., LB $356,884, est. $276,500, (1 bidder) Type T-35, T-71, 1.642 mi. SR 125-(2.71-3.86), F-116 (3), (Village of Hamersville), Brown Co.;

O.—**W. L. Johnson Constr. Co. & Assocs.**, P. O. Box 6668, Bexley Station, Columbus, O., LB $114,545, est. $114,000, (3 bidders) Type T-35 on B-119, 1.345 mi. SR 665-19.90, S-116 (3), Franklin Co.;

O.—**Standard Asphalt & Tar Co.**, 1640 Fourth Ave., Charleston, W. Va., LB $258,574, est. $279,200, (3 bidders), Type T-35, 7.382 mi. SR 7-(27.09-34.49), Village of Cheshire, Gallia Co.;

O.—**Charles S. Ratzlaff Constr. Co.**, North Market St., McArthur, O., LB $109,749, est. $112,100, (5 bidders) Type T-35 and structure 0.762 mi. SR 180-(2.74)-(3.39), Ross Co.;

O.—**Edgar Spring, Inc.**, Box 112, New Phila., O., LB $92,192, est. $105,923, (2 bidders) Type T-50, B-35, T-35, 11.91 mi. Carroll, Harrison and Jefferson Counties;

O.—**S. E. Johnson Co.**, P. O. Box 29, Maumee, O., LB $112,941, est. $121,628, (1 bidder) Type T-35, 15.90 mi. Paulding, Putnam and Van Wert Counties;

O.—**Oyler Bros., Inc.**, 1324 Second St. S.W., Canton, O., LB $80,197, est. $71,274, (1 bidder) Type T-35, 10.312 mi. Stark Co.;

O.—**The Shelly Co.**, Thornville, O., LB $115,727, est. $131,798, (3 bidders) Type T-30, T-31, T-32, 36.14 mi. Athens, Hocking and Vinton Counties. Bids May 1. CD 4/5.

Fred A. George, Inc., 3418 George St., Cleveland 29, O., and **J. & G. Haddad Constr. Co.**, 8021 Whitehaven Dr., Cleveland, O., CA $316,343, est. $400,000 (5 bidders) storm-sanitary sewers, Fairlawn Sect., BROOK PARK, O. Village, 5950 Eastland Rd., Brook Park, O. Bids Apr. 30; awarded May 1. CD 4/19.

McSteen & Brooks, 13947 Cedar Rd., Cleveland 18, O. LB $69,855, est. $45,000 (4 bidders) 12 in. water main Five Points Rd., BROOK PARK, O. Village, 5950 Eastland Rd., Brook Park, O. Bids Apr. 30. CD 4/19.

H. & H. F. Hosea Co., 410 Elliott St., Cincinnati, O., LB $368,474, est. $457,000, (6 bidders) sewage treatment plant for Sycamore Dist. near Remington, CINCINNATI, O. Comrs. Hamilton Co., Court House, Cincinnati, O. Alfred Lefeber & Assocs., 2933 Woodburn St., Cincinnati, O., engrs. Bids May 1. CD 4/11.

▲ **Rust Eng. Co.**, 575 6th Ave., Pittsburgh, Pa. LB $4,018,292, est. $4,200,000 (10 bidders) sewage treatment plant; Contr. A, six 112x270 ft. open aeration tanks; six 15x112 ft. settling tanks; 3 gallery bldgs., along 700 ft. tunnel, etc. for 75 m.g. capacity plant, TOLEDO, O. City, John W. Alspach, Serv. Dir., Safety Bldg., Toledo, O. Bids May 1. CD 4/6.

▲ **INDIANA**—State Hy. Dpt., State House Annex, Indianapolis.

Ind.—**McMahan Ill. Corp.**, Wabseka, Ill., LB $229,951, est. $242,807, bit. resurf. RS-3974 F-209 (6);

Ind.—**The Brewer Co.**, Madeira, O., LB $74,356, est. $81,914, bit. resurf. RS-3981, LB $401,978, est. $406,618, b. conc. R-3998, "S-400 (5);

Ind.—**Brooks Constr. Co.**, 1123 Barthold St., Fort Wayne, Ind., LB $370,743, est. $398,895, wid'n., resurf. RS-3990, F-98 (26);

Ind.—**Seneca Petroleum Co.**, 3258 S. Canal St., LB $274,077, est. $288,843, R-3991 F-104 (18), F-208 (6), 208 "C";

Ind.—**C. A. Studebaker Co.**, Uniondale, Ind., LB $160,381, est. $168,485, wid'n., resurf. RS-3992, F-116 (6), F-238 (4), 238 "D", 117 "E";

Ind.—**Breslin Constr. Co.**, 1433 S. Preston St., Louisville, Ky., LB $177,408, est. $196,373, wid'n., resurf. RS-399, S-362 (1);

Ind.—**Mohr Constr. Co.**, 14200 S. Union St., Kokomo, Ind., LB $132,554, RS-3994;

Ind.—**Feigel Constr. Co.**, 800 E. Michigan St., Evansville, Ind., LB $426,650, est. $516,695, wid'n., resurf. RS-3996.

Ind.—**Hipskind Drainage Co.**, 1725 Winter St., Fort Wayne, Ind., LB $178,686, est. $186,587, bit. resurf. RS-3997.

Mercury Builders, 5412 W. North Ave., Chicago, Ill., LB $440,601, community and bathhouse, shelter and utility bldg., ARLINGTON HEIGHTS, ILL. Arlington Heights Park Dist., City Hall, Arlington Heights, Ill. Bids Mar. 20.

▲ **Divane Bros. Elec. Co.**, 3826 W. Van Buren St., Chicago, Ill., LB $1,098,285. 6 bridges addns., Chicago River & N. Wabash, N. State St., N. Clark St., N. La Salle, W. Washington and W. Madison St., CHICAGO, ILL. City, City Hall, Chicago, Ill. CD 12/2/53.

▲ **Kenny Constr. Co.**, 3220 Oakton St., Skokie, Ill., LB $1,382,325, Howard St. Intercepting Sewer, Morton Grove and Niles, CHICAGO, ILL. Metropolitan Sanitary Dist. of Greater Chicago, 100 E. Erie St., Chicago, Ill.

Swanson Asphalt Co., Inc., 3056 W. 47 Pl., Chicago, Ill., LB $141,924, paving sites 38, 39 and 40 contract parking facilities, CHICAGO, ILL. City, City Hall, Chicago, Ill.;

Consolidated Constr. Co., 161 S. Wells St., Chicago, Ill., LB $159,500, parking site 24 addns., W. Wilson and W. Monroe Aves., W. of N. Broadway (Chicago, Ill.)

† **Du Pons Constr. Co.**, 8057 Sheridan Rd., Kenosha, Wis., CA, $118,000, outdoor swimming pool and bath house, Naval Training Center, GREAT LAKES, ILL. Ninth Naval Dist., Great Lakes Naval Training Station, Great Lakes, Ill. CD 6/28/51, under Public Building.

Anthony Giancola, 4012 W. Taylor St., Chicago, Ill., LB $191,292, storm sewerage sys., area bounded by Naperville Rd., 39 St., Cass Ave. and Cuner Rd., WESTMONT, ILL. Westmont Surface Water Protection, Parkway Dr., Westmont, Ill. Bids Apr. 18. CD 4/11.

▲ **MICHIGAN**—State Hy. Dpt., Lewis Cass Bldg., Lansing.

Mich.—**S. J. Groves & Sons**, Wesley Temple Bldg., Minneapolis, Minn., CA $1,975,290, est. $2,130,000, paving dual concrete 8.936 mi. US 127, M-33-79, CI-RN, M33-75, C4RN, Mason-Leslie-Vevay, Ingham Co.; CA $3,175,827, est. $3,120,000, dual conc. paving, constr. six bridges 6.618 mi. Fenton-Munday, BM 25-52, CI-RO, BM 85 of 25-6-4, CI-RO, etc., Genesee Co.;

Mich.—**Loselle Constr. Co.**, 1555 Goddard St., Wyandotte, Mich., CA $910,999, est. $960,000, dual c. conc. Fort St., Rockwood-Brownstown, IN 82-191, CS-UN 66-UN (IN 65-1), Wayne Co. Grand total $6,062,116. Bids May 11. CD 4/18, under LB.

Globe Constr. Co., Kalamazoo, Mich., CA $140,132. Proj. 558, 1.1 mi. wid'n., bit. aggregate, 40 ft. wide on E. Main St. from city limits to Nazareth Rd. in Kalamazoo Twp., KALAMAZOO, MICH. Bd. Road Comrs., Kalamazoo Co., County Bldg., Kalamazoo, Mich. Bids Apr. 9. CD 4/4.

BUILDINGS—LB & CA

▲ **Bechtel Corp.**, 612 S. Flower St., Los Angeles 17, Calif. CA Est. $7,000,000. design and construct PLANT to produce zirconium for atomic reactors, ASHTABULA, O. United States Industrial Chemical Div., National Distillers Corp., 99 Park Ave., New York 16, N. Y. CD 5/4.

▲ **Marvin Helf, Inc.**, 10001 Carnegie Ave., Cleveland 6, O. Own Forces. $3,000,000. 191 US Steel prefabricated HOMES, Mayfield Rd. east of Gates Mills, CHESTERLAND, O.

Ajax Constr. Co., 6319 Wiethe St., Cincinnati, O. CA Est. $600,000. 15,000 sq. ft. steel, concrete block CLINIC BLDG., 9th and Elm Sts., CINCINNATI, O. DeCourcy Clinic, 210 W. 9th St., Cincinnati, O. Wm. Byrnes, 1659 Sutton St., Cincinnati, O., archt.

Mintz Constr. Co., 3121 Euclid Ave., Cleveland 15, O. CA Est. $500,000. 3 story brick, glass, aluminum OFFICE, CLEVELAND, O. Jay F. Zook, Inc., Union Commerce Bldg., Cleveland 14, O. Bids Mar. 7. Awarded Apr. 28. CD 2/16.

Peter D. Kleist & Co., 21670 Center Ridge Rd., Cleveland 16, O. CA Est. $200,000. 14,000 sq. ft. PLANT and OFFICE, Enterprise Ave. near W. 130 St. CLEVELAND, O. Sterling Die Div., Pratt & Whitney Co., 1300 Brookpark Rd., Cleveland 9, O. Awarded May 1.

▲ **H. C. Huber Constr. Co.**, 631 E. Stroop Rd., Dayton, O., CA Est. $2,000,000. 40-unit, 200,000 sq. ft., steel, concrete, masonry mall-type SHOPPING CENTER, 2,000-car parking, Dorothy Lane and U. S. 25, DAYTON, O. Hills & Daley Center, Inc., c/o contractor.

Schaefer Bros. Constr. Co., 1600 Fall Ave., Cleveland 13, O. LB $382,743 (6 bidders) general constr., HIGH SCHOOL addn. and alterations, GARFIELD HEIGHTS, O. Bd. Educ., 4900 Turney Rd., Garfield Heights, O. Bids Apr. 26. CD 4/3.

▲ **Bethlehem Steel Co.**, 3-235 General Motors Bldg., Detroit, Mich., CA, furnishing, erecting steel for superstructure, approx. 30,000 tons of steel, for STAMPING PLANT, TWINSBURG, O. Total est. $85,000,000. Chrysler Corp., 3675 E. Outer Dr., Detroit, Mich. Awarded May 1. CD 11/21.

Hunkin-Conkey Constr. Co., 1740 E. 12 St., Cleveland 14, O. CA Over $8,000,000. above ground portion of stamping plant (Twinsburg, O.).

▲ **Allis-Chalmers Mfg. Co.**, 807 Foshay Tower, Minneapolis, Minn., CA, $837,355, furnishing, installing 22,000 kw. TURBINE-GENERATOR at municipal power plant, PERU, IND. City, City Hall, Peru, Ind., Bids Apr. 17.

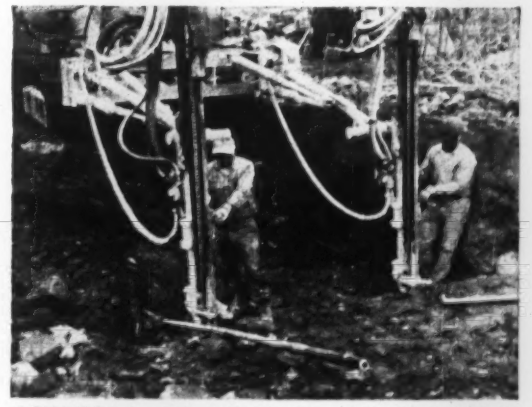
Springfield Boiler Co., 1967 E. Capitol Ave., Springfield, Ill., CA $743,817 furnishing, installing STEAM GENERATING UNIT (Peru, Ind.).

Lee Constr. Co., Inc., 127 N. Dearborn St., Chicago, Ill., LB $356,410. OFFICE, Armstrong and Elston Aves., CHICAGO, ILL. Chicago Transit Auth., 734 Merchan-

(Continued on page 147)

Du Pont MS Delay Caps minimize vibration ...permit precision blasting near home area

SPECIAL GELATIN 40% USED IN SEWER EXCAVATION WITHIN 50 FEET OF DWELLINGS



DRILLING holes. At this point, holes were drilled to an 11-foot depth with a 3' x 3' pattern.

LOADING holes with Special Gelatin 40% (1¼ x 8) and MS (millisecond) Delay Electric Blasting Caps.

EXCAVATING the well-broken rock with a 1½-yard backhoe. Well-balanced dynamite charges and MS Delay Caps worked together to curb excessive throw.

Precision blasting was needed! At some points the Rock Creek sewer in Avondale, Missouri, passed within 50 feet of homes. Great care had to be taken while blasting so that neither vibration nor thrown rock disturbed the occupants. To get the job done on schedule and without complaints, the J. A. Tobin Construction Co. of Kansas City, Kansas, selected Du Pont explosive products—and got the desired results.

Properly designed blasts, containing the correct number of holes and primed with the proper periods of Du Pont MS Delay Caps, reduced vibration to an absolute minimum. Skillful loading with Du Pont Special Gelatin 40% dynamite assured a charge sufficient to break the rock satisfactorily, but not strong enough to cause violent throw.

The MS Delay Caps on this job ranged from MS-25 to MS-200. There are 19 delay intervals available for your operations. Speak to your Du Pont representative, or write E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

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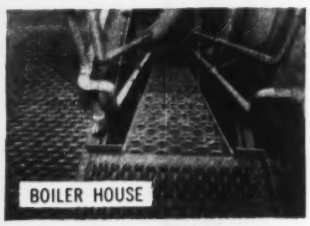

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(Continued from page 144)

else Mart, Chicago, Ill. Battey & Childs, 231 S. La Salle St., Chicago 4, Ill., engrs.

East Side Health District, Dr. Carroll F. Leonard, dir., 412A Missouri Ave., East St. Louis, Ill., rejected bids May 2. 1 story L-shaped, brick, concrete HEALTH CENTER, EAST ST. LOUIS, ILL. Will re-advertise. CD 3/13.

Joseph T. Carp, Inc., 5640 N. Northwest Hy., Chicago, Ill., CA, $260,000. 1 story, brick FACTORY, 25 and North Aves., MELROSE PARK, ILL. Owner, c/o Ralph Stoetzel, archt., 1111 W. Monroe St., Chicago, Ill.

Shephard Constr. Co., 1015 Plainfield Rd., Joliet, Ill., CA $571,000. 1 and 2 story, brick, stone HIGH SCHOOL, PLAINFIELD, ILL. School Dist. 202, Plainfield, Ill. CD 3/13, under LB.

Linden & Sons, Inc., 1102 10 St., Rockford, Ill., CA, $100,000, HEAT TREATMENT PLANT addn., ROCKFORD, ILL. Muhlemeyer Heat Treatment Co., 1531 Preston St., Rockford, Ill.

▲ **Gust K. Newberg Constr. Co.**, 2040 N. Ashland Ave., Chicago, Ill., LB $2,130,500. Niles Twp. HIGH SCHOOL, Edens Hy. and Oakton St., SKOKIE, ILL. School Dist. 219, c/o Niles Twp. High School No. 1, Skokie, Ill. Bids Apr. 16. CD 4/2.

▲ **Geo. A. Fuller Co.**, 111 W. Washington St., Chicago, Ill., CA $1,300,000, substructure for POWER PLANT, Greenwood Ave., WAUKEGAN, ILL. Public Service Co. of Northern Illinois, 309 Washington St., Waukegan, Ill.

Eriksen & Blanchard, Inc., 924 S. Water St., Wilmington, Iowa, LB $404,821. HIGH SCHOOL addn., YORKVILLE, ILL. Yorkville Community High School Dist. 100, Yorkville, Ill. Bids Apr. 5.

Permanent Constr. Co., 4103 N. 3 St., Milwaukee, Wis., CA, $500,000. 1 story, 140,000 sq. ft. ADMINISTRATION BLDG., NEENAH, WIS. Marathon Corp., Menasha, Wis. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., archts.

Ellis Stone & Constr. Co., Stevens Point, Wis., LB $522,800 general contract HIGH SCHOOL, STEVENS POINT, WIS. Sisters of St. Joseph Academy, Stevens Point, Wis. Bids Apr. 20. CD 4/16.

▲ **George H. Pastor & Sons**, 19971 James Couzens St., Detroit, Mich. Owner builds. $2,000,000. 105 brick HOMES, Beech and Inkster Rd. Sects., Dearborn Twp., DEARBORN, MICH.

Cook Paint & Varnish Co., 3301 Bourke St., Detroit 38, Mich. Owner builds. $500,000. paint FACTORY, Bourke St., DETROIT, MICH.

▲ **Darin & Armstrong, Inc.**, 2041 Fenkell St., Detroit 26, Mich. LB $3,116,000 (6 bidders) Contr. MH 52-A, substructure CONVENTION EXHIBIT BLDG., DETROIT, MICH. City, Frank G. Schmaecke, pres., Memorial Hall Comm., 151 W. Jefferson St., Detroit, Mich. Bids May 1. CD 4/30.

▲ **Richter Constr. Co.**, 2282 Webb St., Detroit, Mich., and **Anchor Home Builders, Inc.**, 10315 Linwood St., Farmington, Mich. CA Est. $10,000,000. 520 brick HOMES, 208 acre site, 13-Mile Rd. West of Orchard Lake Rd., Westbrooke Manor, FARMINGTON, MICH. Gordon-Begin, 15450 James Couzens St., Detroit, Mich.

State, A. N. Langins, dir., State Bldg. Dpt., Lansing, Mich., cancelled bids to have been opened Apr. 26, HEATING PLANT, LANSING, MICH. CD 4/9.

Wahl Constr. Co., 2602 David Stott Bldg., Detroit, Mich. Owner builds. $550,000. Glendale Manor Subdivision, 50 brick HOMES, Baldwin north of Walton Blvd., PONTIAC, MICH.

▲ **Bilt Rite Homes, Inc.**, 6315 Elizabeth St., Detroit, Mich., **Avison & Purser**, 17605 James Couzens Hy., Detroit, Mich., **Largo Homes, Inc.**, 1831 James Couzens Hy., Detroit, Mich., (and others) CA Est. $10,000,000. Dresden Village, 500 ranch style and tri-level brick HOMES, Canal and Clinton River Rds., off Van Dyke south of 20 Mile Rd., STERLING, MICH. Charles Goldberg, Michigan Lumber Co., 6450 E. 7 Mile Rd., Detroit, Mich. Leo-Pearl, c/o owner, archt. CD 5/8.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† **Nebraska**—BA 5/23—Soil Conservation Service, 134 S. 12 St., Lincoln, 45-NB-56, stabilization dam, Brownell Creek Watershed, near Syracuse, Otoe Co.

† **Ark., Jacksonville**—LABORATORY—BA 5/24—U. S. Eng., P. O. Box 867, Little Rock, reconnaissance technical laboratory, Little Rock Air Force Base, ENG-03-050-56-70, $100,000-$500,000. Extended date CD 4/6.

Neb., Red Cloud—BA 5/24—City, WW improv., $110,000, Pennington, Durham & Richardson, Inc., 2962 Harney St., Omaha, engrs.

Tex., Deer Park—BA 5/24—City, asph. paving portion 3 streets, $145,000. CD 12/20.

Tex., Stephenville—BA 5/24—City, Henry Clark, mayor, City Hall, sewerage sys. improv., $150,000. Plans deposit $15. Reaves & Gregory, 3332 W. 7th St., Fort Worth, engrs. CD 3/9.

† **Colo., Denver**—BA 5/29—U. S. Eng., 1709 Jackson St., Omaha, Neb., improv. to process water system, decontamination, and reconditioning building, Rocky Mountain Arsenal, Inv. 25-066-56-91. CD 3/22.

Okla., Vinita—BA 5/29—City, sanitary main sewer, sewage disposal plant, $275,000. Plans deposit $20. Lee M. Bish & Co., Colcord Bldg., Oklahoma City, engrs. CD 12/28.

† **Texas**—BA 5/29—Soil Conservation Service, 1st Natl. Bank Bldg., Temple, (71-56) floodwater retarding structures, earthfill embankments, Site 12, Green Creek, approx. 12 mi. southeast of Dublin, clearing and grubbing 41 acres; 46,300 cu. yd.-excav.; 260,500 cu. yd. pl. and rolling embankment; 29,000 sq. yd. pl. topsoil in earth spillway; 69 cu. yd. concrete, Erath Co.

† **Wyoming and Colorado**—LUBRICATION SYSTEMS—BA 5/29—Bureau Reclamation, Dpt. Interior, Denver Federal Center, Denver, Colo., furnishing, installing centralized grease lubrication systems for turbines and pressure regulator valves at Flatiron & Pole Hill powerplants and for turbines at Kortes and Alcova, Colorado-Big Thompson, Missouri River Basin and Kendrick Projs., Spec. 700C-40g. L. N. McClellan, Bldg. 1 A, Denver Federal Center, Denver, Colo., ch. engr.

▲ **Tex., Corpus Christi**—BA 5/30—City, City Hall, superstructure for City Life Bridge across Ship Channel near Savage Lane, $1,308,186. CD 3/30/55.

† **Texas**—BA 5/31—Soil Conservation Service, 1st Natl. Bank Bldg., Temple (79-56) flood water retarding structures and earthfill embankments, Sites 8C and 9R, east fork of Trinity River, 30 acres clearing and grubbing, 49,000 cu. yd. excav., 171,000 cu. yd. place and roll embankment, 15,000 sq. yd. pave top soil, 61 cu. yd. clearing A. S. B concrete etc., near McKinney, Collin Co. CD 11/14/54.

† **Kan., Fort Riley**—AMMUNITION IGLOOS—BA 6/1—U. S. Eng., 1800 Federal Office Bldg., 911 Walnut St., Kansas City 6, Mo., constr. two concrete ammunition igloos barricades, ENG-23-029-56-85, $75,000-$150,000. CD 5/2.

Mo., St. Louis—SKATING RINK—BA 6/5—City, Bd. P. Service Frank J. McDevitt, pres., 304 City Hall, 22 Blvd. and Market St., Zone 3, 150x250 ft. outdoor ice and roller skating rink; 1 story, 60x250 ft. recreational bldg.; Forest Park west of Kings highway to be known as Mark C. Steinberg Memorial... $900,000. Frederick W. Dunn, 1218 Olive St., Zone 3, archt. William C. Becker, 411 N. 7 St., Zone 1, engr. Ferris & Hamig, 2706 Olive St., Zone 3, mech. engrs. CD 11/23.

† **Ark., Blytheville**—CLUB, MESS—BA 6/7—U. S. Eng., P. O. Box 867, Little Rock, officers club and mess, Blytheville Air Force Base, ENG-03-050-56-73. $100,000-$500,000. Extended date CD 4/18.

▲ **Tex., Raymondville**—BA 6/15—Willacy Co. Navigation Dist., R. F. Allen, secy., Raymondville, harbor and port facilities, dredging and constr. jetties, Port Mansfield, $2,500,000. J. V. Cornutte, 106 S. 2 St., engr. CD 7/26/55.

▲ **Colo., Denver**—BA 6/29—Bd. Water Comrs., City & Denver Co., City & County Bldg., Denver, Roberts Tunnel, 23 mi. long, near here, Tipton & Kalmbach Insurance Bldg., engrs. CD 8/22.

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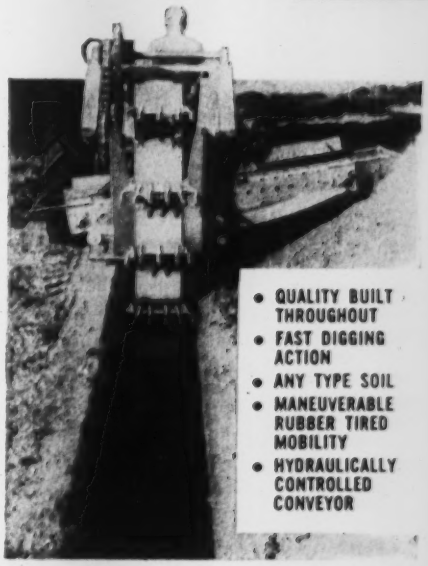

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† **Colo., Colorado Springs**—BUILDINGS—BA On Or About 7/10—Dpt. Air Force, U. S. Air Force, Air Force Academy Constr. Agency, P.O. Box 167, constr. buildings in service and supply area, incl. warehouse, IEO facilities, automotive maintenance facilities, Air Force Academy, IVG 05-613-21. Plans deposit $50. CD 8/5/54.

BUILDINGS—BA

▲ **Colo., Buena Vista**—DORMITORY, etc.—BA 5/24—Colorado State Reformatory, Buena Vista, 3 story, 43x191 ft., concrete, steel dormitory, laundry and storage bldg. $1,150,000. Jamieson & Williams, 810 22 St., Denver, engrs.-archts. CD 9/29/55.

▲ **Tex., Houston**—BANK—BA 5/31—Federal Reserve Bank of Dallas, 400 S. Akard St., Dallas, 4 level masonry Federal Reserve Bank Branch office, $2,100,000. Extended date: Pheips & DeWees & Simmons, 342 W. Woodlawn St., San Antonio, and Golemon & Rolfe, 5100 Travis St., archts. CD 5/4.

▲ **Iowa, Fort Dodge**—SCHOOL, etc.—BA 6/28—Bd. Educ., Fort Dodge, High School, and Junior College Bldg. $1,800,000. Smith, Voorhees, Jensen, Silletto & Assocs., 206 Davidson Bldg., Des Moines, archts. CD 12/15.

BUILDINGS—SLC

Colo., Greeley—BOWLING ALLEY—Columbine Recreational Corp., First Natl. Bank Bldg., soon lets contract, 1 story, 50x190 ft., brick bowling alley. $400,000. Nat S. Sachter, 1321 Bannock St., Denver, engr.-archt. CD 2/27.

▲ **Tex., Houston**—SHOPPING CENTER—Port City Village Corp., c/o Irvin D. Klein & Assocs., archts., 1317 Austin St., soon lets contract shopping center. $1,250,000. Walter P. Moore, 2 Pinedale St., engr. CD 3/1.

Tex., Houston—DORMITORIES—The Mary Gibbs Jones College of Rice Institute, Main St., soon lets contract two 4 story masonry girls' dormitories. $650,000. Lloyd & Morgan, 4605 Montrose Blvd., archts. I. A. Naman, 3405 Montrose Blvd., and Walter P. Moore, 2 Pinedale St., engrs.

HEAVY CONSTRUCTION—LB & CA

† **Hurley Constr. Co.,** 403 S. Robert St., St. Paul, Minn., LB **$46,051,** (9 bidders) reconstr. timber sills and apron, Pokegama Dam, Mississippi River near Grand Rapids, CIVENG-21-018-56-59, MINNESOTA. U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul 1, Minn. Bids May 1. CD 4/9.

Jeffries Constr. Co., Mankato, Minn. LB **$146,769.** (4 bidders) subgrade correction; sand gravel sub-base, gravel base, road mixed bit. surf. 2.5 mi. between TH 109 at Wells and 2.5 mi. east, 3.9 mi. between TH 22 at Wells and CAR 127, 4 mi. north, BLUE EARTH, MINN. Faribault Co., H. G. Siverson, aud., Blue Earth, Minn. Bids Apr. 30. CD 4/12.

† **Ashbach Constr. Co.,** 1910 W County Rd. C, St. Paul, Minn. CA **$794,825.** constr. apron and taxiways, etc. at Minn. Air National Guard Base, Williamson-Johnson Airport, DULUTH, MINN. U. S. Eng., 1217 Post Office & Custom House, St. Paul 1, Minn. CD 4/27, under LB.

Lametti & Lametti, 211 N. Pascal St., St. Paul, Minn. LB **$444,517.** (3 bidders), Proj. 1, approx. 9,400 lin. ft. 24- to 54-in. sanitary sewers from St. Paul city limits to County Road B, ROSEVILLE (P.O. St. Paul), MINN. VILLAGE, B. H. Hammersten, clk., Roseville, Minn. Bids Apr. 30. CD 4/9;
F. Morettini, 1416 Maryland Ave. E., St. Paul, Minn. LB **$329,575.** (3 bidders) Proj. No. 2, approx. 17,530 lin. ft. 12- to 27-in. sanitary sewers and 600 lin. ft. 6 in. force main, from St. Paul city limits to County Road B (Roseville, Minn.).

H. Holthusen, Grygla, Minn. LB **$85,999.** (6 bidders) gravel base, road mixed bit. base, road mixed bit. surf. 5.4 mi. between Jct. T.H. 59, 3 mi. east of Hadel and SAR 4, THIEF RIVER FALLS, MINN. Pennington Co., C. W. Rodekuhr, aud., Thief River Falls, Minn. Bids Apr. 25. CD 4/4.

H. Schulz, Carthage, S. D. LB **$90,377.** (1 bidder) gravel sub-base, gravel base, road mixed bit. surf. 2 mi. between SAR 4 in Avoca and CAR 30; 6 mi. between SAR 5 at Iona and CAR 37 south of Wirock, SLAYTON, MINN. Murray Co., C. D. Peterson, aud., Slayton, Minn. Bids May 1. CD 4/12.

▲ **IOWA**—State Hy. Comn., Ames,
Iowa—**A. M. Cohron & Son,** 6110 S. W. 12 St., Des Moines, Iowa. LB **$124,742.** 445x24 ft. continuous I-beam bridge on local road over Cedar River in Sec. 19-87-11, S-344 (5), Black Hawk Co.;
Iowa—**Taylor & Isenhower, Inc.,** Hudson, Iowa. LB **$83,397.** 300 24 ft. continuous I-beam bridge on local road in SW¼ Sec. 32-89-13, S-2677 (1) Black Hawk Co.;
Iowa—**Iowa Bridge Co.,** 5770 2 St., Des Moines, Iowa. LB **$281,770,** 120 ft. continuous I-beam underpass on relocation of U. S. 18 at M and St. L. RR in Mason City UG-889 (8), Cerro Gordo Co.; LB **$122,787,** 3 rein.-con. box culverts and extens., 210x52 ft. continuous I-beam bridge at various locations on Iowa 141 from U. S. 6 north to Johnson Station UN-215 (2), Polk Co., Group No. 2;
Iowa—**Schmidt Constr. Co.,** Winfield, Iowa. LB **$98,610.** Group No. 1; LB **$182,173** Group No. 2; LB **$183,778,** Group No. 3, 24 rein.-con. box and pipe culverts and extens., 410x28 ft. continuous I-beam bridge, 520.5x28 ft. continuous I-beam bridge at various locations on relocation of U. S. 34 from west corporation line of Mt. Pleasant westerly to present U. S. 34 in SE¼ Sec. 36-72-8, FN-151, Henry and Jefferson Counties. Bids May 1. CD 4/19.

▲ **IOWA**—State Hy. Comn., Ames,
Iowa—**Central Constr. Co.,** Indianola, Iowa. LB **$205,920** conc. 0.729 mi. U-781 (9), Appanoose Co.;
Iowa—**Fred Carlson Co.,** Decorah, Iowa. LB **$73,136.** c. conc. 0.613 mi. FN-47, Tama Co.; LB **$128,497** c. conc. 1.007 mi. Widn. P-602 Washington Co.;
Iowa—**Hallett Constr. Co.,** Crosby, Minn. LB **$102,048.** c. conc. 3.486 mi. SN-197, Wright Co.; LB **$124,286,** c. conc. 4.245 mi. T-444 (6), Wright Co.;
Iowa—**Western Eng. Co.,** Harlan, Iowa. LB **$179,903** b. conc. 2.977 mi. F-394 (1), Audubon and Shelby Counties; LB **$222,215** b. conc. 8.142 mi. T-155 (2), Plymouth Co.; LB **$85,428,** b. conc. 4.065 mi. S-255 (2), Plymouth Co.; LB **$92,582,** b. conc. 3.684 mi. T-354 (2), Plymouth Co.; LB **$120,970** b. conc. 6.014 mi. S-2374 (1), Plymouth Co.;
Iowa—**Iowa Road Building Co.,** Fairmont, Minn., LB **$96,763.** b. conc. 3.977 mi. S-954 (3), Hamilton Co.;
Iowa—**Green Constr. Co.,** 321 Locust St., Des Moines, Iowa, LB **$507,462,** b. conc. 2.685 mi. UN-215 (2), Polk Co.; LB **$297,405** b. conc. resurf. 15.11 mi. Widn. P-1023 (2), Madison and Warren Counties; LB **$243,908,** b. conc. resurf. 12.432 mi. Widn. P-1023 (1), Polk and Warren Counties;
Iowa—**Hargrave Constr. Co.,** 2424 Bever St. S. E., Cedar Rapids, Iowa, LB **$204,235.** b. conc. resurf. 9.129 mi. widn. P-1068, Cedar, Muscatine and Scott Counties; LB **$243,478,** b. conc. resurf. 6.231 mi. Widn. FN-289, Johnson Co.; LB **$159,177,** b. conc. resurf. 7.903 mi. Widn. P-1070 Johnson and Muscatine Counties; LB **$354,542** b. conc. resurf. 16.306 mi. Widn. P-1069, Muscatine Co.; LB **$179,626,** b. conc. resurf. 8.658 mi. Widn. P-204, Scott Co.;
Iowa—**Concrete Materials & Constr. Co.,** 405 Granby Bldg., Cedar Rapids, Iowa. LB **$172,601,** rolled stone base and bit. 8.002 mi. S-1202 (2) Marshall Co.;
Iowa—**E. M. Duesenberg, Inc.,** Clear Lake, Iowa, LB **$86,166.** grading 3.321 mi. S-1716 (1), Allamakee Co.;
Iowa—**Iowa Bridge Co.,** 5770 2 St., Des Moines. LB **$118,633,** grading 9.233 mi. UG-889 (8) Cerro Gordo Co.;
Iowa—**Booth & Olson, Inc.,** 529 Insurance Exchange Bldg., Sioux City, Iowa. LB **$221,664.** grading 8.384 mi. FN-151, Henry and Jefferson Counties. Bids May 1. CD 4/19.

▲† **W. A. Klinger Constr. Co.,** 2015 7 St., Sioux City, Iowa, LB **$1,378,494** (7 bidders) ag facilities, Sioux City Air Force Base, Inv. 25-066-56-81, SIOUX CITY, IOWA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 3. CD 4/12.

Midwest Pre-Cote Co., 7600 E. 17 St., Kansas City, Mo., LB **$286,250.** oiling 950 mi. Jackson Co. earth roads, KANSAS CITY, MO. Jackson Co., Court House, Kansas City, Mo. Bids Apr. 30.

Miller Electric Co., 528 S. 15 St., Vincennes, Ind. LB **$265,659.** street lighting addns., imprvs., ST. JOSEPH, MO. City, St. Joseph, Mo. Bids Apr. 24. CD 4/18.

† **McAllister-Davis Co.,** 1439 S. Bellevue St., Memphis, Tenn., LB **$496,660,** est. $478,470, Arkansas River (Harris Bend) revetment, near Pine Bluff, Jefferson Co., CIVENG-03-050-56-27, ARKANSAS. U. S. Eng. P. O. Box 867, Little Rock, Ark. Bids Apr. 26. CD 4/13.

Kelley-Nelson, Inc., Gazette Bldg., Little Rock, Ark., CA **$128,500** cost plus fixed fee, filter plant addn., 4 filter beds, LITTLE ROCK, ARK. Little Rock Municipal Waterworks Comn., Auditorium, Little Rock, Ark. Bids Apr. 13, awarded May 1. CD 3/28.

Western Development Co., 133 Mears St., Chadron, Neb., CA **$58,325,** water sys. imprvs., CHADRON, NEB. City, Chadron, Neb. Bids Apr. 2. CD 3/27.

General Electric Co., Electric Bldg., Omaha, Neb. LB **$211,500,** circuit breakers, control equipment, steel sub-station for station at 10B and Blondo Sts., OMAHA, NEB. Omaha Public Power Dist., 17 and Harney Sts., Omaha, Neb. Bids May 2. CD 4/17.

† **Joseph L. Pehl,** 828 N. Front St., Nevada, Mo., LB **$361,774.** 1,100,000 cu. yd. uncl. excav.; 956,000 cu. yd. levee embankment; 10,500 cu. yd. rip-rap for Big Slough, Cowskin Floodway, Parcel B, Phase II, near Wichita, Inv. CIVENG-34-066-56-54, KANSAS. U. S. Eng., Box 61, Tulsa, Okla. Bids Apr. 25. CD 4/4.

Rhodes Constr. Co., Newton, Kan., CA, **$301,427,** sewage treatment facilities, SSF-1, Sumner Co.; SSF-2, Butler Co.; SSF-3, Chase Co.; SSF-4, Lyon Co., KANSAS. Kansas Turnpike Auth., P. O. Box 681, Topeka, Kan. Bids Apr. 6. CD 3/29;
Constant Constr. Co., Lawrence, Kan., CA, **$158,614,** sewage treatment facilities, SSF-6, Leavenworth Co.; SSF-5, Shawnee Co. (Kansas).

† **M. A. Swatek & Co.,** 1137 N. W. 2nd St., Oklahoma City, Okla., LB **$73,335,** est. $100,000, two floodwater dams near Weatherford; Inv. SCS 23-OK-56, OKLAHOMA. Soil Conservation Service, Stillwater, Okla. Bids Apr. 30. CD 4/16.

Mark Holloway Constr. Co., 100 S.E. 4 St., Oklahoma City, Okla., CA **$75,931,** est. $76,600, asph. pavement Dist. 1292, OKLAHOMA CITY, OKLA. City, City Hall, Oklahoma City, Okla. W. W. Baker, Oklahoma City, Okla., city engr. Awarded Apr. 17. CD 7/27.

Clark Constr. Co., Eldon, Mo., CA **$115,878,** est. $125,000, sewage disposal plant, Eastern Oklahoma State Hospital, VINITA, OKLA. Bd. of Affairs, Capitol, Oklahoma City, Okla. Bids May 3. CD 4/18.

TEXAS—State Hy. Comn., Austin,
cancelled bids to have been opened May 15, C.R.I.&G. and St. L.&S.W.R.R. overpasses, Hutton Branch on Hy. US 77, 0.363 mi. Proj. IN-ING22 (10) and IN 22 (11), Dallas Co. CD 4/20.

▲† **Trinity Constr. Co.,** Box 3024, Houston, Tex. CA **$1,699,118,** est. $1,000,000-$5,000,000 Brays Bayou channel rectification in part at Brays Bayou, Houston. CIVENG-41-243-56-70, TEXAS. U. S. Eng., Box 1229, Galveston, Tex. Bids Apr. 17. CD 4/25, under LB.

J. E. Foster & Son, Inc., 1400 W. Lancaster St., Fort Worth, Tex. Own Forces. $80,000, hard paved streets, curb and gutter, FORT WORTH, TEX.

J. E. Foster & Son, Inc., 1400 W. Lancaster St., Fort Worth, Tex. Own Forces. $45,000, bldg. site earthwork, grading, FORT WORTH, TEX.

J. E. Foster & Son, Inc., 1400 W. Lancaster St., Fort Worth, Tex. Own Forces. $80,000, sanitary sewers; $77,500, storm sewers FORT WORTH TEX. CD 4/2.

J. E. Foster & Son, Inc., 1400 W. Lancaster St., Fort Worth, Tex. Own Forces. $50,000, water lines, facilities, FORT WORTH, TEX.

† **Lufkin Constr. Co., Inc.,** Box 717, Lufkin, Tex., CA $895,596. A. C. & W. facilities, ENG-41-443-56-60, LUFKIN, TEX. U. S. Eng., 100 W. Vickery Blvd., Fort Worth, Tex. Bids Feb. 24, Awarded Apr. 24. CD 2/29, under LB.

W. O. Nevil, Builder, 9539 Biscayne St., Dallas, Tex. Own Forces. $45,500, water lines, facilities, MESQUITE, TEX.

W. O. Nevil, Builder, 9539 Biscayne St., Dallas, Tex. Own Forces. $77,500, contr. and concrete paving streets and alleys, MESQUITE, TEX.

W. O. Nevil, Builder, 9539 Biscayne St., Dallas, Tex. Own Forces. $45,000, bldg. site zone earthwork, filling, grading, MESQUITE, TEX.

Clyde Yarbrough, Inc., Box 2123, Odessa, Tex. CA $180,108, water and sanitary sewer addns. in Crescent Park, ODESSA, TEX. City, City Hall, Odessa, Tex. Kenneth E. Esmont, Court House, Odessa, Tex., engr. Bids Apr. 24. CD 1/29/53.

† **Bureau Reclamation, Dpt. Interior,** Glendo, Wyo., rejected bids Apr. 19, 115-kv Alcova Switchyard addns., Missouri River Basin Proj., Transmission Div., Spec. DC 4642, WYOMING. New bids May 10. CD 3/12.

Chamber Freese, Lander, Wyo., LB **$51,400.** water storage reservoir, LANDER, WYO. Town, Town Hall, Lander, Wyo. Bids Apr. 23. Bishop & Spurlock, 280 Main St., Lander, Wyo., engrs. CD 5/18/55.

Winslow Constr. Co., 3002 S. Huron St., Englewood, Colo., LB **$75,000,** site grading and placing foundation for 4 m.g. covered water reservoir, AURORA, COLO. City, City Hall, Aurora, Colo. Bids Apr. 26. Ken R. White, 1565 Marion St., Denver, Colo., engr.

Schwab Electric Co., Longmont, Colo., CA **$92,500,** est. $290,553, electrical work for new stadium BOULDER, COLO. University of Colorado, Campus, Boulder, Colo. Bids Apr. 26, awarded Apr. 27. J. W. Sallada, 1623 E. 17 Ave., Denver, Colo., engr.-archt.

▲† **Capitol Steel & Iron Co.,** P. O. Box 2489, Stockyard Station, Oklahoma City, Okla. LB **$2,059,923,** structural steel for academic bldg., Air Force Academy, 05-613-56-17, COLORADO SPRINGS, COLO. Dpt. Air Force, Pentagon Bldg., Wash., D. C. Bids May 1. CD 4/12.

† **Howard P. Foley Co.,** 2104 E. Platte Ave., Colorado Springs, Colo., LB **$474,000.** electrical outdoor substations at air force academy, COLORADO SPRINGS, COLO. Dpt. Air Force, P. O. Box 1670, Colorado Springs, Colo. Bids Apr. 26. CD 8/5/54.

† **C. H. Leavell & Co.,** Box 1829, El Paso, Tex. CA **$751,100.** static missile laboratory, Holloman Air Force Base, ENG-29-005-56-68, ALAMOGORDO, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. CD 4/26, under LB.

BUILDINGS—LB & CA

Hasslen Constr. Co., Ortonville, Minn., CA, $518,800. HIGH SCHOOL, MINNEOTA, MINN. Bd. Educ., B. Tillemans, clk., Minneota, Minn. Bids Apr. 12. CD 4/18, under LB.

O. A. Stocke & Co., Rochester, Minn., CA, $480,000. general contract 50,000 sq. ft. IBM BLDG., ROCHESTER, MINN. Rochester Industrial Opportunities, Inc., H. Kamm, mgr., Rochester, Minn. Ellerbe & Co., E. 505 First Natl. Bank Bldg., St. Paul, Minn., archts. International Business Machines Corp., New York, N. Y., lessee.

▲† **Donovan Constr. Co.,** 1725 Carroll Ave., St. Paul, Minn. and **Carlson-Duluth Co.,** 230 E. Superior St., Duluth, Minn. CA Approx. $3,600,000. (5 bidders) OPS and POWER BLDGS., on Hy. 53, near Duluth TWIG, MINN. Western Electric, Inc., Defense Proj. Div., 220 Church St., New York 13, N. Y. Bids Apr. 13. CD 3/30.

Contemporary Homes, Inc., 9220 Lackland Rd., St. Louis 14, Mo. Owner Builds. $750,000. 84 RESIDENCES, Sect. IV of Robinwood Subdivision, vicinity of Dechake Rd. and U. S. 66, FLORISSANT, MO.

Roy Scheperle Constr. Co., 527 Madison St., Jefferson City, Mo. CA total est $650,000. general contract, 2 story, bsmnt., 90x150 ft., rein.-con., steel Form Bureau BUILDING, Hy. No. 50 west, JEFFERSON CITY, MO. Farm Bureau Building Corp. (Missouri Farm Bureau Federation), 207 E. Capitol Ave., Jefferson City, Mo. Bids Mar. 28. CD 3/14.

W. & R. Building & Investment Co., Frank Weinberg, pres., 7649 Delmar Blvd., University City 5, Mo. Owner Builds. $600,000. 106 RESIDENCES, 41-acre tract west side Woodlawn Ave., north of Manchester Rd., KIRKWOOD (ST. LOUIS 22, P. O.), MO.

S. P. Shakofsky Constr. Co., 6601 Delmar Blvd., University City 5, Mo. CA est. $500,000. general contract, 3 story, bsmnt., OFFICE, parking area at site at 4100 Lindell Blvd., ST. LOUIS, MO. Remington-Rand Div., Sperry-Rand Corp., W. A. Reed, mgr., 1107 Olive St., St. Louis 1, Mo. Bids Apr. 17. CD 3/28.

(Continued on page 153)

New! BIGGER PAYLOADS! ALL-WHEEL DRIVE TRACTION!

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6 x 6 READY-MIXED CONCRETE CARRIER

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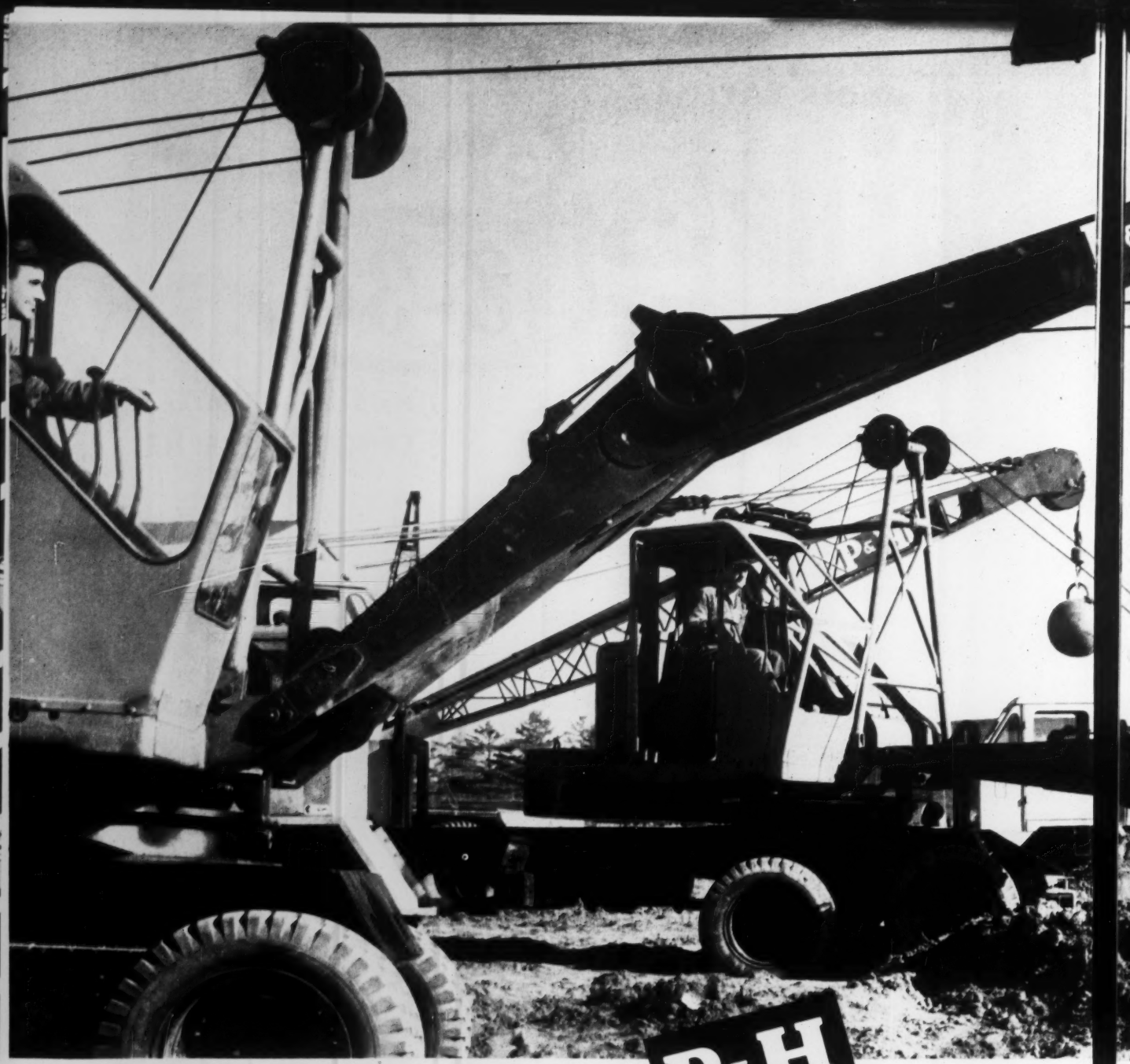

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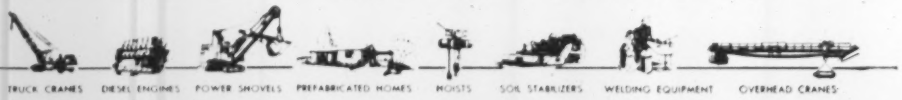

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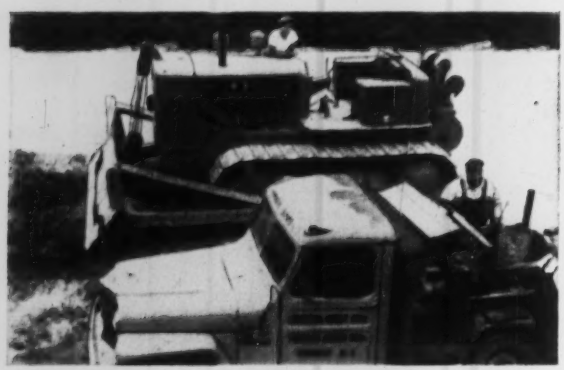

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160 Calls per Day reports the base station dispatcher.

Or, if lack of a compressor is holding up an important job, it takes just a few minutes to contact everyone using compressors and find out who can spare one. There may be a question about the location of a utility line. Are the utilities superintendent's drawings up to date? There's no danger of a major mistake when he can pick up his microphone and call field headquarters for the answer.

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(Continued from page 148)

▲ Rust Eng. Co., 575 6 Ave., Pittsburgh, Pa., CA Est. $10,000,000, design and construct liner board MILL for kraft paper plant, PINE BLUFF, ARK. Dierks Paper Co., Div. Dierks Forests, Inc., c/o Fred M. Dierks, vice pres., Hot Springs, Ark. CD 11/29.

▲ Swenson Constr. Co., 3305 Terrace St., Kansas City 8, Mo. CA est. $1,000,000. 3 story, 85x218 ft., brick, concrete block RESEARCH CENTER, Mission, KANSAS CITY, KAN. Spencer Chemical Co., 1004 Baltimore St., Kansas City, Kan. Bids Apr. 19. CD 3/28.

Hoke Constr. Co., Stillwater, Okla., LB $475,495, HIGH SCHOOL, ELK CITY, OKLA. Elk City Independent School Dist., Elk City, Okla. Caudell, Rowlett & Scott, 1611 N. Broadway, Oklahoma City, Okla. archts. Bids Apr. 26. CD 5/19/54.

Smiser Constr. Co., 17 N.E. 26 St., Oklahoma City, Okla., LB $353,419, est. $350,000. CHURCH addn., OKLAHOMA CITY, OKLA. Westminister Church, 4400 N. Shartel St., Oklahoma City, Okla. Parr & Aderhold, 513 N. Broadway, Oklahoma City, Okla., archts.

Berry & Floyd Davis Co., Reserve Loan Life Bldg., Dallas, Tex. Own Forces. $358,170, 26 DWELLINGS; $415,000, 36 DWELLINGS, in Walnut Hills, DALLAS, TEX. CD 2/3.

Buckner & Pittman, 3121 N. Harwood St., Dallas, Tex. CA Approx. $256,000, Central SERVICE CENTER alterations, DALLAS, TEX. Dallas Light & Power Co., Dallas Light & Power Bldg., Dallas, Tex. Bids Mar. 21. CD 3/14.

Longhorn Constr. Co., 9620 John West Rd., Dallas, Tex. Own Forces. $414,000, 21 DWELLINGS; $345,100, 16 DWELLINGS, DALLAS, TEX. CD 1/31.

▲ Brown & Root, Inc., Box 3, Houston, Tex., CA $4,500,000, expansion of CHEMICAL PLANT, perchlorethylene, CA $245,000, STORAGE FACILITIES, DEER PARK, TEX. Diamond Alkali Co., Deer Park, Tex. Wyatt C. Hedrick, 5201 Fannin St., Houston, Tex., engr. CD 4/9.

▲ Tellepsen Constr. Co., 1710 Telephone Rd., Houston, Tex., CA $3,000,000, expansion of synthetic rubber mfg. PLANT, LaPorte Rd., (area bidding for areas, incl. Nos. 1, 8, 9, 10, 11, 13, 14 15, and 16), HOUSTON, TEX. Goodyear Tire & Rubber Co., c/o A. J. Dodge, Purch. Dpt., LaPorte, Tex. Bids Jan. 27. CD 1/18.

United Lumber & Building Co., c/o Jack Perry, 1110 Prospect St., Houston, Tex. Own Forces. $375,000, 33 DWELLINGS; $359,915, 26 DWELLINGS, Lake Forrest Addn., HOUSTON, TEX. CD 2/27.

L. G. Chambers, 2425 Calder St., Beaumont, Tex. Own Forces. $359,500, 31 DWELLINGS, PORT NECHES, TEX. CD 4/5.

Frank Basenberg, 709 E. Ashby St., San Antonio, Tex. Force Account. $366,150, 28 DWELLINGS; $348,875, 25 DWELLINGS, SAN ANTONIO, TEX. CD 4/16.

▲ Broadway Constr. Co., Broadway Ave., San Antonio, Tex. Own Forces. $371,145, 34 DWELLINGS; $360,000, 30 DWELLINGS; $345,500, 25 DWELLINGS, SAN ANTONIO, TEX. Grand total $1,076,645. CD 3/29.

George Dicus, 335 Devonshire St., San Antonio, Tex. Own Forces. $350,000, 22 DWELLINGS, SAN ANTONIO, TEX. CD 3/29.

W. A. Kopplin & Son, 112 Wagon Trail, San Antonio, Tex. Own Forces. $349,910, 29 DWELLINGS, SAN ANTONIO, TEX. CD 3/29.

Carl Reichenbach Co., 247 Top Hill St., San Antonio, Tex. Own Forces. $355,558, 28 DWELLINGS, SAN ANTONIO, TEX. CD 3/29.

Tommy Saunders, Contractor, 2208 N. Zarzamora St., San Antonio, Tex. CA $358,000, 12 DWELLINGS; CA $371,162, 15 DWELLINGS, SAN ANTONIO, TEX. Tommy Saunders, 2208 N. Zarzamora St., San Antonio, Tex. CD 3/22.

▲ Montana Bd. Examiners, Missoula, Mont., rejected bids Apr. 26, RECEIVING and TREATMENT BLDG., Montana State Mental Hospital, WARM SPRINGS, MONT. Est. $1,500,000. CD 4/13.

▲† C. H. Leavell & Co., Box 1451, El Paso, Tex. CA $1,855,426, est. $1,700,000-$2,000,000. 125 HOUSING units, Group 18 Housing, Phase A, Inv. 291-56-9, LOS ALAMOS, N. M. U. S. Atomic Energy Comn., Los Alamos, N. M. Bids Apr. 18. CD 3/13.

FAR WEST

HEAVY CONSTRUCTION—BA

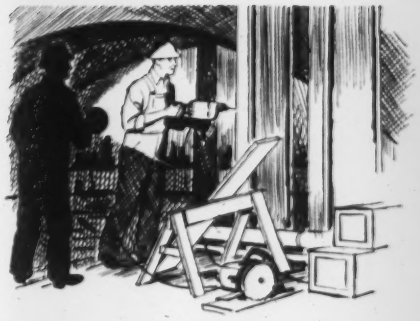
▲ Calif., La Mesa—BA 5/29—La Messa, Lemon Grove, Spring Valley, 4769 Spring St., 33,000 ft. 36 in. pipe Aqueduct supply line and Monte connection, $500,000; pipe lines for Lakeside-Grossmont transmission line, Lakeside-El Cajon Area, $750,000. M. J. Shelton, c/o owner, engr. CD 3/5.

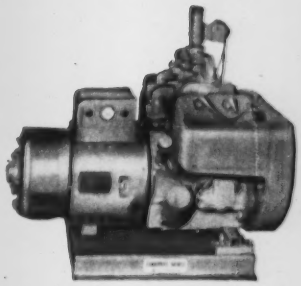
† Washington—BA 5/31—Bureau Reclamation, Dpt. Interior, Division and C Sts. N. W., Ephrata, earthwork, pipe lines, structures, South part Block 46, laterals, wasteways and drains, East Low Canal Laterals, Columbia Basin Proj., about 3 to 9 mi. southeast of Othello, Spec. DC-4677.

† Washington BA 6/21—Bureau Reclamation, Dpt. Interior, Kennewick, earthwork, pipe lines and structures for Main Canal Laterals, Station 1325 plus 00 to Station 2206 plus 06.6, and Atom Pump Discharge Line and Laterals, Yakima Proj., near Kennewick, Spec. DC-4691, adv. ENR 5/17.

BUILDINGS—BA

Wash., Aberdeen—COLLEGE—BA 5/24—School Dist. No. 5, Aberdeen, 4 Grays Harbor Junior College Bldgs.





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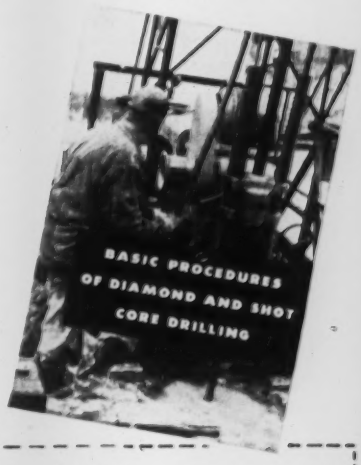

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$800,000. Plans deposit $20. Jansen & Mills, 308 S. Tacoma Ave., Tacoma, archts.

Wash., Seattle—CHURCH—BA 5/25—University Presbyterian Church, E. 47 St. and 15 Ave. N.E., Zone 4, 3 story 80x112 ft., rein.-con. church addn. for Sunday School. $400,000. Rich & Trimble & Assocs., 4507 University Way, Zone 5, archts. CD 11/15/54.

▲ Calif., Norwalk—WARDS—BA 6/7—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, two 2-floor and part bsmnt. 135,000 sq. ft. ward bldgs., Metropolitan State Hospital State Dpt. Mental Hygiene, $4,000,000. Plans deposit $50. CD 4/24.

HEAVY CONSTRUCTION—LB & CA

ARIZONA—State Hy. Dpt., Phoenix,

Ariz.—**Dale F. Payne Contractor,** 2345 W. Thomas Rd., Phoenix, Ariz., LB **$450,902,** est. $475,280 (11 bidders) select material, aggreg. base, bit. plant mix and plant mix seal coat 4.9 mi. F-FI 008-4 (1) Navajo Co.;

Ariz.—**Tanner Bros. Contr. Co.,** 731 N. 19 Ave., Phoenix, Ariz., LB **$197,289,** est. $197,386. select material aggreg. base bit. plant mix and plant mix seal coat 1.8 mi. NON-FA 85-(1956) Mohave Co. Bids May 1. CD 4/20.

† Dist. P. Wks., Office, 12th Naval Dist., San Bruno, Calif., rejected bids Apr. 4, construction and repair roads and aircraft parking apron, Naval Auxiliary Air Station, NOy 91726, Spec. 50134, FALLON, NEV. CD 3/23.

† Donald M. Drake Co., 1600 N.W. Savier St., Portland, Ore., LB **$415,977,** est. $417,079. earthwork, structures for Part 1 of Block 18 laterals and wasteways, East Low Canal Laterals, Columbia Basin Proj., Spec. DC 4667, WASHINGTON. Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids Apr. 26. CD 3/26.

WASHINGTON—State Hy. Comn., Olympia, rejected bids Apr. 17, bit. surf. 10.141 mi. State Hys. 2 and 11-G Coulee City west and from junction with Primary State Hy. 1B to Larson Air Force Base, Douglas and Grant Counties, LB **$161,448,** stockpiling crushed materials on Primary State Hys. 3 and 22 Evans, Barstow and China Bend, Ferry and Stevens Counties LB **$94,000.** CD 4/23, under LB.

▲ WASHINGTON—State Hy. Comn., Olympia,

Wash.—**Murphy Bros.,** E 3728 Broadway, Spokane, Wash. LB **$545,109** (6 bidders) grading, 2 rein.-con. rigid frame slab bridges, 1 rein.-con. slab bridge 2.535 mi. Primary State Hy. 2, FAP IN-002-2 (4), Kittias Co.; LB **$137,059** (2 bidders) bit. 1 rein.-con. rigid frame bridge 0.0994 mi. on Primary State Hy. No. 2, FAP F-029-1 (9) Chelan Co.;

Wash.—**Columbia Asphalt Co.,** Masonic Temple Bldg., Yakima, Wash., LB **$194,242** (2 bidders) bit. surf., non-skid single seal leveling treatment, bit. surf. road mix, b. conc. 18.912 mi. Primary State Hy. 7, FAP F-031-1 (4) Grant Co.; LB **$125,844** (7 bidders) bit. surf., b. conc. 7.494 mi. Sec. State Hy. 3-A, FAS S 0268 (7), Yakima Co.;

Wash.—**N. G. Johnson,** E 1828 Trent St., Spokane, Wash., LB **$106,192** (4 bidders) bit. surf., single seal 113.42 mi. State Hys. 7-C, 2, 7, 10-C and 11-G, Adams, Chelan, Douglas and Grant Counties;

Wash.—**Associated Sand & Gravel Co.,** 2508 Colby St., Everett, Wash., LB **$87,569** (2 bidders) bit. surf., b. conc. 5.586 mi. Sec. State Hy. 1-I, Snohomish Co.;

Wash.—**Wilder Constr. Co.,** 2006 State St., Bellingham, Wash., LB **$138,609** (1 bidder) bit. surf. b. conc. 4.292 mi. Primary State Hy. 1, Whatcom Co.;

Wash.—**R. H. Sussex Co.,** Bellevue, Wash., LB **$195,917** (6 bidders) bit. 6.571 mi. Sec. State Hy. 11-G, FAP F045-1 (3), Adams Co.;

Wash.—received no bids May 1, bit. surf., b. conc. 17.194 mi. Primary State Hys. 10 and 2, FAP F-029-2 (11), F-028-2 (5), F-030-1 (11), Douglas and Okanagan Counties. CD 4/16.

WASHINGTON—State Hy. Comn., Olympia,

Wash.—**Murphy Bros.,** E 3728 Broadway, Spokane, Wash., CA, **$545,109,** grading, 3 bridges 2.535 mi. Primary State Hy. 2, FAP IN-U02-2 (4), Kittias Co. CD 5/7, under LB;

Wash.—**R. H. Sussex,** Bellevue, Wash., CA, **$75,350.** (3 bidders) stockpiling maint. rock, sand mineral aggreg. Primary State Hy. 15, King and Snohomish Counties, **Bids May 1, awarded May 2.** CD 4/16.

† J. D. Shotwell Co., 3113 S. Pine St., Tacoma, Wash., LB **$198,189,** est. $120,569, c. conc. paving area in Regimental Motor Pool No. 2, Inv. 56-154, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Apr 30. CD 3/26.

Lord Bros., 9233 N.E. Calvert Ave., Portland, Ore., LB **$256,864,** sewers, pump stations and treatment lagoon, LONG BEACH, WASH. City, City Hall, Long Beach, Wash. Bids Apr. 30. CD 4/18.

Home Electric Co., 2212 A St., Tacoma, Wash., CA **$131,491.** street light standards for street lighting sys. imprvs., TACOMA, WASH. City, City Hall, Tacoma, Wash. Bids Apr. 16. CD 4/5.

▲† Gates & Fox Co., 329 Primrose Rd., Burlingame, Calif., CA **$1,649,750,** Trinity Dam diversion tunnel, Central Valley Proj., Spec. DC 4650, CALIFORNIA. Bureau Reclamation, Dpt. Interior, Weaverville, Calif. Bids Apr. 4, awarded May 1. CD 4/6, under LB.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Calif.—**Ball & Simpson,** 685 Delaware St., Berkeley, Calif., LB **$861,959,** grading, placing untreated base material, cement treated base surf. with plant mix, 1 bridge between Tiburon St. and Pt. San Quentin, San Rafael, Marin Co.;

Calif.—**Rice Brothers, Inc.,** 900 Victor Rd., Lodi, Calif., LB **$204,081** surf. 8.2 mi. Rte. 96 Mono Co.;

Calif.—**Baldwin Contg. Co., Inc. & H. Earl Parker, Inc.,** 12 and F Sts., Marysville, Calif., LB **$848,840** (2 bidders) grading, surf. 1.3 mi. US 40A and 2 bridges, Yuba Co.;

Calif.—**K. E. C. Co., Inc.,** 22018 S. Norwalk Blvd, Artesia, Calif., LB **$82,294,** (5 bidders) roadside area planting 2.3 mi., Los Angeles Co. Bids May 2. CD 4/9.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Fredrickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., LB **$2,272,537,** est. $2,350,000 (4 bidders) 4-lane divided freeway 3.4 mi. 6 bridges, US. 101 in and near Santa Barbara, Santa Barbara Co. Bids May 2. CD 4/9.

▲ CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

Griffith Co., 1060 S. Broadway, Los Angeles 15, Calif., LB **$2,661,000.** (5 bidders) grading, paving 2.6 mi. 4-lane divided freeway between 0.3 mi. south of Arlington Ave. and 0.1 mi. north of 14 St. and 5 bridges, Riverside Co. Bids May 3. (Correction—cost). CD 5/7, under LB.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Calif.—**Norman I. Fadel, Inc.,** P. O. Box 206, North Hollywood, Calif., CA, **$886,663,** grading 4.6 mi. U. S. 101 and rein.-con. girder bridge, Humboldt Co.;

Calif.—**Gordon H. Ball,** 300 Camille Ave., Danville, Calif., CA, **$1,485,158,** grading, paving 5.7 mi. US 99, installing hy. lighting, 3 rein.-con. bridges, wid'n. 1 rein.-con. bridge Tulare Co. Bids Apr. 25, awarded May 3. CD 5/1, under LB.

▲ CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Peter Kiewit Sons Co., 442 Post St., San Francisco, Calif., CA **$2,711,100** grading, surf. 3.5 mi. U. S. 101 near San Rafael and Cloverleaf traffic interchange at Corte Madera Wye to provide 6-lane freeway, Marin Co. Bids Apr. 4, awarded May 3. CD 4/6, under LB.

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento, rejected bids Apr. 18, structural steel railroad bridge alterations, concrete retaining wall, West Suburn Underpass, Hy. 40 Placer Co., LB **$645,237.** CD 4/25, under LB:

▲† McDonald & Kruse, 7540 Wheatland Ave., Sun Valley, Calif., LB **$1,183,037** (4 bidders) channel imprvs. Westwood and Awtelle Channels, CIVENG-04-353-56-49, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 3. CD 4/12.

† C. S. Phillips Constr. Co., 969 Phillips Ave., Petaluma, Calif., LB **$150,000,** est. $180,000 (7 bidders) clearing Sutter Bypass from Fremont Weir upstream to Nelson Bend, CIVENG-04-167-56-48, CALIFORNIA. U. S. Eng., 1209 8 St., Sacramento, Calif. Bids May 1. CD 4/2.

Charles J. Dorfman, 124 N. La Brea Ave., Los Angeles, Calif., CA **$159,285** (16 bidders) sanitary sewers in Annexation No. 27, COSTA MESA, CALIF. City, 119 E. 19 St., Costa Mesa, Calif. Bids Apr. 26. CD 4/16.

Jack Brkich Co., 9638 Rush St., El Monte, Calif., CA **$79,413** (10 bidders) Lindley Ave. and Rayen St., Imprvt. Dist., sanitary sewers, LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Awarded Apr. 30. CD 4/6.

Ransome Co., 4030 Hollis St., Emeryville, Calif., LB **$79,022** (4 bidders) imprv. 27 St. between Grove and San Pablo Sts., OAKLAND, CALIF. City, City Hall, Oakland, Calif. CD 5/16.

† McGuire & Hester, 796 66 Ave., Oakland, Calif., CA **$109,400** (1); **$107,400** (2); **$95,400** (3) replacing water line, tidal area, Naval Magazine, NBy 4540, Spec. 4540/56, PORT CHICAGO, CALIF. Dist. P. Wks. Office, Twelfth Naval Dist., San Bruno, Calif. Bids Apr. 27.

▲† M & K Corp., 405 Montgomery St., San Francisco, Calif., CA **$1,146,000.** sewerage disposal facilities, San Francisco Naval Shipyard, NOy 91734, Spec. 50139, SAN FRANCISCO, CALIF. P. Wks. Officer, San Bruno, Calif. Bids Apr. 25. CD 4/10

† Engineers Ltd, Pipeline Co, 11858 San Pablo St, El Cerrito, Calif, LB **$78,341** (6 bidders) installing gas mains at Naval Radio Station, Spec 50144, SKAGGS ISLAND, CALIF. P. Wks. Office, Twelfth Naval Dist., San Bruno, Calif.

Precision Drilling Co., P. O. Box 693, Santa Rosa, Calif., LB **$43,667.** drilling three 18 in. irrigation wells at California State Prison, SOLEDAD, CALIF. State Div. Architecture, 1120 N St., Sacramento, Calif. Bids May 1. CD 4/17.

BUILDINGS—LB & CA

W. Wilcox, Blackfoot, Idaho, Day Labor, $500,000. 50 HOUSES at Mud Lake, near IDAHO FALLS, IDAHO.

Busboom & Rauh, N 601 Cedar St., Spokane, Wash., CA **$867,970,** general contract, 3 story rein.-con. LIBRARY, MOSCOW, IDAHO. University of Idaho, Moscow, Idaho. Bids Apr. 20. CD 4/25, under LB.

▲ H. & J. Constr. Co., 1722 E. Indian School Rd., Phoenix, Ariz., CA **$2,000,000,** 25-store SHOPPING CENTER, and parking area, TEMPE, ARIZ. Dr. Fred Sechrist, Flagstaff, Ariz. Victor Gruen & Assocs., 135 S. Doheny Dr., Beverly Hills, Calif., archts.

▲ B. Lampson, Pasco, Wash., Day Labor, $1,500,000. HOUSING DEVELOPMENT, near Hawthorne School, west of KENNEWICK, WASH. CD 10/6.

▲ K. T. Henderson, 1362 Colorado St., Longview, Wash., LB **$1,030,874** (4 bidders), general contract, SENIOR HIGH SCHOOL, LONGVIEW, WASH. School Dist. 122, Longview, Wash. Bids May 2. CD 4/6;

Longview Plumbing & Heating Co., 1146 Commerce Ave., Longview, Wash., LB **$349,637** (2 bidders) mechanical contract (Longview, Wash.).

St. John Corp., 5121 W. Jefferson Blvd., Los Angeles, Calif., CA **$591,148,** Cerritos Ave. and Nutwood St. SCHOOL addns., ANAHEIM, CALIF. Anaheim City School Dist., 251 E. Center St., Anaheim, Calif. Bids Apr. 26. CD 4/19/55.

Holdener Constr. Co., 2608 "R" St., Sacramento, Calif., CA, **$535,067,** GYMNASIUM and CAFETERIA, San Juan High School, FAIR OAKS, CALIF. San Juan Union High School Dist., 7551 Greenback Lane, Fair Oaks, Calif. Bids Apr. 18. CD 5/2, under LB.

Brumett & Demblan, Inc., 210 S. Garfield Ave., Monterey Park, Calif., Owner Builds. **$704,000.** 64 frame, stucco DWELLINGS, Tract 1687, FULLERTON, CALIF. CD 4/11.

▲ Centinella Valley Union High School Dist., 231 S. Grevillea St., Inglewood, Calif., rejected bids Apr. 3, Lennox HIGH SCHOOL, INGLEWOOD, CALIF. Est. **$1,000,000.** Will re-advertise. CD 3/26.

▲ James I. Barnes Constr. Co., 1119 Montana Ave., Santa Monica, Calif., CA **$1,349,300.** general contract, branch OFFICE, for Calif. Dpt. Employment, LOS ANGELES, CALIF. State Dpt. Wks., 1120 N. St., Sacramento, Calif. Bids Apr. 18, awarded May 1. CD 4/23, under LB.

Desert Hospital, c/o Williams, Williams, Williams and Clark, Frey & Chambers, archts., 121 S. Palm Caugen Dr., Palm Springs, Calif., rejected bids Apr. 4, HOSPITAL addn., PALM SPRINGS, CALIF. Est. $500,000. Will re-advertise. CD 3/20.

▲ Haas & Haynie, 275 Pine St., San Francisco, Calif., CA **$3,000,000.** 150,000 sq. ft., rein.-con. MEDICAL-DENTAL BLDG., incl. Palo Alto Clinic on Stanford University Campus, PALO ALTO, CALIF. Peninsula Associates, c/o contractor. Warnecke & Warnecke, 507 Howard St., San Francisco 9, Calif., archts.

CANADA

HEAVY CONSTRUCTION—BA

Ont., Toronto—HEATING SYSTEM—BA 5/23—Defence Constr. Ltd., 56 Lyon St., Ottawa, heating system, R.C.C.C. Tap Relay Centre, 87 Richmond St. E. $150,000. Plans deposit $25.

BUILDINGS—BA

B. C., Quesnel—SCHOOL—BA 5/23—School Dist. 28, Quesnel, Junior High School. $400,000. Plans deposit $25. A. W. Gray, 1401 Vancouver Block, Vancouver, archt.

Alta., Edmonton—OFFICE—Bids Asked—Gardner Investments Ltd.; c/o Blakey, Blakey & Ascher, archts., 10042 109 St., 5 story, steel, rein.-con. office bldg. $700,000.

BUILDINGS—SLC

▲ Alta., Edmonton—OFFICE—Imperial Oil Ltd., 102 St. and 100 Ave., soon lets contract 180x235 ft., rein.-con., office bldg. $1,000,000. K. C. Stanley & Assocs., 618 Northern Hardware Bldg., archts. CD 6/8/55.

B. C., Vancouver—OFFICE—Imperial Investments Ltd., c/o 1280 W. Pender St., soon lets contract 7 story, rein.-con. 50x85 ft. office, 1035 W. Broadway, $500,000. G. Hamilton, 1280 W. Pender St., archt.

Que., Montreal East—SHOPS—Imperial Oil Ltd., 10510 Notre Dame St. E., Montreal, soon lets contract 1 story, 200x360 ft., structural steel mechanical shops, part of refinery expansion. $500,000. Surveyor, Nenninger & Chenevert, 1440 St. Catherine St. W., Montreal, engrs. CD 4/26.

HEAVY CONSTRUCTION—LB & CA

C. W. Carry Ltd., 10530 103 St., Edmonton, Alta., CA, **$101,616,** supplying, erecting 300 tons structural steel for P. T. Bldg. and Dention Barracks, EDMONTON, ALTA. Defense Constr. Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 12. CD 3/29.

BRITISH COLUMBIA—B. C. Govt. Parliament Bldgs., Victoria,

Interior Contracting Co. Ltd., 1372 Fairview Rd., Penticton, B. C., LB **$124,056.** Springbrook Bridge, Proj. No. 187, Columbia Hy., Cranbrook Electoral District. Bids Apr. 25. CD 4/20.

John Laing & Son (Canada) Ltd., 640 W. Hastings St., Vancouver, B. C., CA, **$727,789,** 12-mi. road between Upper Cambell Lake and Buttle Lake, BRITISH COLUMBIA. B. C. Power Comn., P. O. Box 500, Victoria, B. C. Bids Mar. 27, awarded Apr. 25. CD 4/6, under LB.

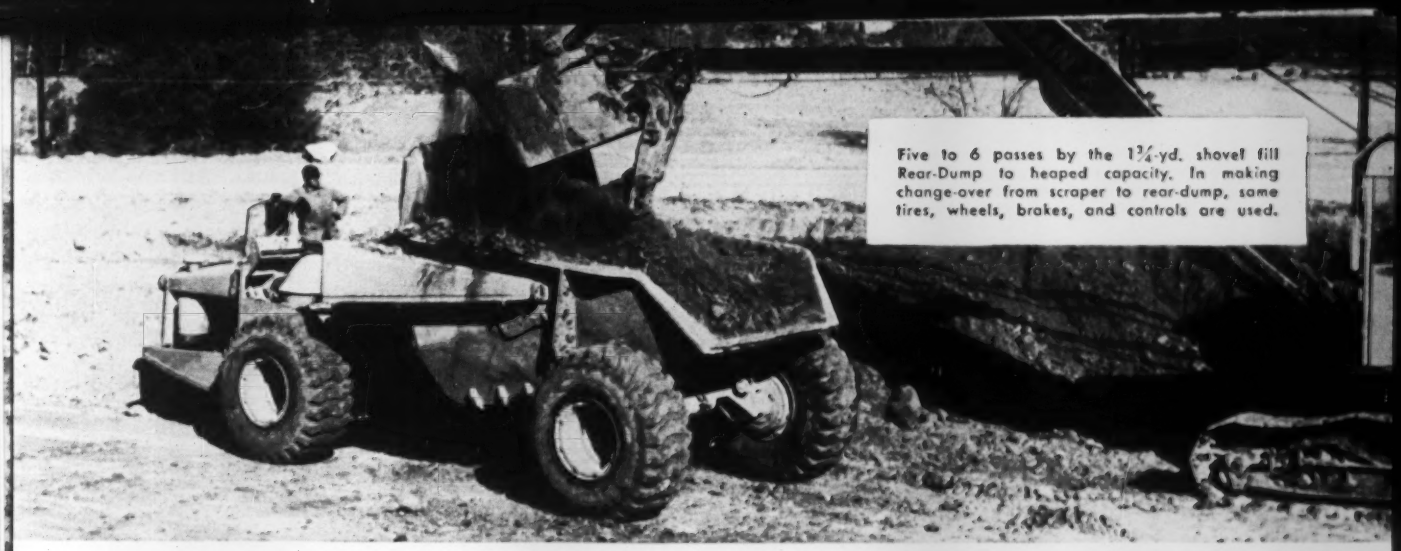
▲ Maxwell-Simson & Assocs. Ltd., 1931 W. Georgia St., Vancouver, B. C., CA, **$1,135,000.** supplying three 3000 k.w. tri-fuel diesel generating units, Dawson Creek, BRITISH COLUMBIA. B. C. Power Comn., Victoria, B. C. Awarded Apr. 24.

▲ Maxwell-Simson & Assocs. Ltd., 1931 W. Georgia St., Vancouver, B. C., CA, **$2,600,000.** supplying seven 300-k.w. tri-fuel diesel generating units, four for new generating station at Prince George and three for new generating plant at Quesnell, BRITISH COLUMBIA, B. C. Power Comn., Victoria, B. C.

▲ Majestic Contractors Ltd., 408 Royal Trust Bldg., Edmonton, Alta., CA **$1,000,000.** 38 mi. 12 in. pipe line from Toronto to Waterdown, ONTARIO. Imperial Oil Ltd., 56 Church St., Toronto, Ont. Bids May 22. CD 3/21.

Mannix Ltd., Calgary, Alta., CA **$841,494** (2 bidders) track laying, ballasting, assoc. work, approx. 39.5 mi. double laying railway line being relocated as result of the building, St. Lawrence Power Proj., ONTARIO.

(Continued on page 156)



Five to 6 passes by the 1¾-yd. shovel fill Rear-Dump to heaped capacity. In making change-over from scraper to rear-dump, same tires, wheels, brakes, and controls are used.

Alabama contractor shows how to get "double value" from each dollar of equipment investment

"Interchangeability" has a powerful meaning to Clyde O. Mitchell, Birmingham. It's the way he assures himself "double value" from his versatile C Tournapulls.

For dirtmoving, Mitchell hitches 14-yd. scrapers behind his 2-wheel "C" prime-movers. Whenever he encounters shovel rock, he switches scraper bodies for rear-dumps to handle this problem. The ability to switch to rear-dumps eliminates added ownership or rental expense of trucks, reduces maintenance cost as well as equipment and parts inventory, and permits operation under weather and haul road conditions that would shut down truck operation.

Double duty means added profits

Mitchell has made extra profits twice so far on important jobs because of this quick-change feature of his C Tournapulls.

First double-duty assignment was a state highway improvement job at Decatur, Alabama. On this job, the scrapers handled 800,000 yds. of dirt, while Rear-Dumps moved 100,000 yds. of rock.

Recently he relocated and straightened 4.1 miles of State Highway 431 between Attalla and Boaz. Here, of the 486,000 cu. yds. of material to be moved, about 16% was rock, 75% chert, and 9% clay. The dirtmoving was handled by two C Tournapulls with Scraper, three 18-yd. tractor-drawn FP scrapers, and three self-propelled scrapers of another make. The Tournapulls were then equipped with Rear-Dumps to haul rock . . . about 78,000 yards.

4200′ cycle every 6 minutes

Time studies show the Tournapull Rear-Dumps are real producers. With wide, easily entered bodies, they were loaded with 10 pay yards by a 1¾-yd. Lorain shovel in an average of 1 minute, 40 seconds. Working 4200′ cycles, each round-trip took only 6 minutes. Haul and return speeds averaged 12 mph. Hourly output for the 2 machines was 180 pay yards per 55-minute hour.

More speed on long hauls

This kind of production and Tournapull interchangeability highly pleases the owners. Says Supt. G. M. Wakefield: "I like the C Tournapull prime-mover. It's got a good scraper and rear-dump. It will stand up against any dirtmover."

Adds operator C. L. Moore: "The Tournapull can turn everywhere, and it's got more speed on long hauls. It's simple to understand . . . easier to operate than other rigs."

Figure out for yourself on the basis of cost alone the extra value of Tournapull interchangeability. An additional haul unit costs about 25% of the total initial price of prime-mover and original haul-unit combination. Interchangeable haul-units can be purchased at any time.

Find out how this double-duty equipment can give *you* double earning power for every dollar of investment. For more facts and owner-verified case histories, write or phone today.

Dumping on the run, Rear-Dump builds subgrade in cut where rock has been removed. Average dumping time was about 20 seconds. Electric controls respond instantly for steering and controlled dumping.

Tournapull—Trademark Reg. U.S. Pat. Off. R-801-H-b

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In Rolls about 87" wide x 77 ft. long

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FOR HEAVY ROAD AND
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$170.00 Net Ton—Min. Order 20 Tons
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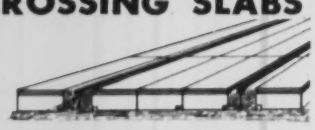

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- Durable, smooth riding, low maintenance.

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Write for Bulletin X-541

(Continued from page 154)

Hydro-Electric Power Comm. of Ontario, 620 University Ave., Toronto 2, Ont. Bids Apr. 17. CD 3/27.

Francis Hankin & Co. Ltd., 2032 Union Ave., Montreal, Que., LB $135,000, mechanical equipment for new water filtration plant, BEAUHARNOIS, QUE. City, City Hall, Beauharnois, Que. C. E. Gravel, 3717 Levesque Blvd. L'Abord a Plouffe, engr.

Leo Provost, 7 Ellice St. Beauharnois, Que., LB $218,000 (11 bidders) filtration plant, BEAUHARNOIS, QUE. City, City Hall, Beauharnois, Ont. C. E. Gravel, 3717 Levesque Blvd., L'Abord a Plouffe, engr.

▲ J. P. Cartier Ltd., 1819 Glendale Ave., Montreal, Que., LB $1,026,300 (13 bidders) exten., widening Burnside Ave. from Stanley to Guy Sts., MONTREAL, QUE. City, City Hall, Montreal, Que. Bids Apr. 25. CD 4/13.

Godard & Bros. Ltd., 5319 St. Andre St., Montreal, Que., CA, $267,440. Hockey arena, MOUNT ROYAL, QUE. Town, Town Hall, Mount Royal, Que. Bids Apr. 23, awarded Apr. 25. CD 4/13.

BUILDINGS—LB & CA

▲ Burns & Dutton Concrete & Constr. Co. Ltd. 9004 125 Ave. Edmonton, Alta., CA $1,750,000. 175 HOUSING UNITS, incl. ground services, EDMONTON, ALTA. Central Mortgage & Housing Auth., 870 Portage Ave., Winnipeg, Man. Bids Mar. 1. CD 2/17.

▲ Dominion Constr. Co. Ltd., 10117 111 St., Edmonton, Alta., CA, Est. Over $1,000,000. 1 story 75,000 sq. ft. brick, steel PARTS and ACCESSORIES DEPOT, 10,000 sq. ft. OFFICE space, EDMONTON, ALTA. Ford Motor Co. of Canada Ltd., 120 Bloor St. E., Toronto, Ont. Awarded Apr. 24. CD 12/30.

A. & B. Constr. Co. Ltd., Nanaimo, B. C., CA $934,969. 3 story, bsmnt. 69x154 ft., rein.-con. HOSPITAL, CAMPBELL RIVER, B. C. Campbell River & District General Hospital Society, Campbell River, B. C. Bids Apr. 13, awarded Apr. 25. CD 4/5.

Eastern Woodworkers Ltd., Brother St., New Glasgow, N. S., LB $650,000 (6 bidders) SCHOOL, GANDER, NEWFOUNDLAND. Gander Amalgamated School Bd., Gander, Newfoundland. Bids Apr. 12.

Eastern Woodworkers Ltd., Brother St., New Glasgow, N. S., LB $350,000 (8 bidders SCHOOL, GANDER, NEWFOUNDLAND. St. Joseph's Parish, Gander, Newfoundland. L. R. Fairn & Assocs., 41 Argyle St., Halifax, N. S., archts.

M. Sullivan & Son Ltd., 234 Elgin St., Arnprior, Ont., CA, $600,000, three 105x240 ft., steel, masonry wings, PLANT EXPANSIONS with OFFICES addn., BROCKVILLE, ONT. Phillips Electrical (1953) Ltd., Kingston Rd., Brockville, Ont. Awarded Apr. 26. CD 3/13.

Douglas G. Forrest, 1085 Bronson Ave., Ottawa, Ont. Owner Builds, $520,000. two 42-suite APARTMENTS, Churchill Ave., OTTAWA, ONT. J. M. Woolfson, 104 Lewis St., Ottawa, Ont., archts.

Marshall Developments Co., 185 Bloor St. E., Toronto, Ont., CA, $850,000. 9 story, 2 bsmnts. rein.-con. block apartment and OFFICE BLDG. TORONTO, ONT. Yorkville Towers Ltd., c/o Crang & Boake, archts., 79 Huntley St., Toronto, Ont., archts. Alex Tobias & Assocs., 24 Cecil St., Toronto, Ont., engrs. Awarded Apr. 16.

Milne & Nichols Ltd., 37 Bloor St. W., Toronto, Ont., CA, Est. $255,000 (4 bidders) 1 story 36,000 sq. ft., masonry PLANT addn., concrete fdn., TORONTO, ONT. Johnson, Matthew & Mallory Ltd., 110 Industry St., Toronto, Ont. Bids Apr. 24, awarded May 1. CD 4/19.

Louis Donolo, Inc., 8320 St. Lawrence Blvd., Montreal, Que., CA, $650,000. (4 bidders) superstructure 2 story 150x300 ft. PLANT, MONTREAL, QUE. Hygrade Food Products Ltd., 5437 St. Lawrence Ave., Montreal, Que. Bids Mar. 29, awarded Apr. 16. CD 3/29.

Walter G. Hunt Co. Ltd., 1405 Bishop St., Montreal, Que., CA, Est. $125,000 (8 bidders) 55x257 ft., structural steel, concrete block diesel SHOP addn., in freight yards, MONTREAL, QUE. Canadian Pacific Ry. Co., c. A. Colpitts, ch. engr., Windsor Station, Montreal, Que. Bids Apr. 24, awarded Apr. 27. CD 4/26.

▲ Turrett Constr. & Housing Co. Ltd., 5752 Park Ave., Montreal, Que., Owner Builds, $1,000,000. expanding HOUSING PROGRAM, MONTREAL, QUE. H. M. Tolchinsky, 5810 Cote St. Luc Rd., Montreal, Que., archt.

Foster Wheeler Ltd., East Chester Ave., St. Catharines, Ont., CA, $100,000. water cooling tower, REFINERY EXPANSION, MONTREAL EAST, Que. Imperial Oil Ltd., 10510 Notre Dame St. E., Montreal, Que. Awarded Apr. 26. CD 4/26.

Foundation Co. of Canada Ltd., 1900 Sherbrooke St. W., Montreal, Que., CA, $120,000. WAREHOUSE, St. Patrick St., MONTREAL EAST, QUE. Imperial Oil Ltd., 2000 Sherbrooke St. W., Montreal, Que. David Mathias, 1375 Green Ave., Montreal, Que., archt. Awarded Apr. 27.

J. M. Jeanson Ltee, 912 St. Louis St. Sherbrooke, Que., CA, $800,000. two STORES, Belvedere St. S., SHERBROOKE, QUE. Lionell Bernier, hardware, 810 Belvedere St. So., Sherbrooke, Que. A. Belanger, 40 Vimy St. N., Sherbrooke, Que., archt.

ALASKA

HEAVY CONSTRUCTION—BA

† ALASKA—BA 6/5—Bureau P. Rds., Dpt. Commerce, Federal Bldg., Juneau, surfacing, oiling 18.3 mi. Kenai River Hy. Proj. 5-A6, 84. C. F. Wyller, c/o owner, engr.

† Alaska, Ketchikan—BA 6/6—Alaska P. Wks., Dpt. Interior, P. O. Box 1181, Juneau, 4,574 ft. 4- to 18-in. water supply mains, Proj. AAA 50-A-210, Unit 2. Plans deposit $25.

HEAVY CONSTRUCTION—LB & CA

† D. H. Clark, Anchorage, Alaska, LB $115,246 (9 bidders) constr. SBRA-Z radio range station at Campbell Creek, near here with five towers, Z-marker, transmitter bldg. etc. ANCHORAGE, ALASKA. Civil Aeronautics Admin., Anchorage, Alaska.

† W. A. Smith Contg. Co., Spenard, Alaska, CA $521,890, reconstr. rail yard, SEWARD, ALASKA. The Alaska Railroad, Dpt. Interior, Anchorage, Alaska. Bids Apr. 5. CD 4/12, under LB.

BUILDINGS—LB & CA

▲† B-E-C-K Constructors, 3647 Stone Way, Seattle 3, Wash., LB $2,470,665, est. $2,129,106, (6 bidders) FAMILY QUARTERS, BACHELOR OFFICERS QUARTERS for women and NCO OPEN MESS, Inv. 56-41, FORT GREELEY, ALASKA. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids May 3. CD 4/20.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ El Salvador—The Comision Ejecutiva del Puerto de Acajutla (CEPA), Edificio Regalado, 2a Avenida Sur, No. 15, San Salavdor.

Salzgitter Industriebau Gesellschaft MBH of Salzgitter Drutte, West Germany, CA $4,282,000, breakwater-pier Acajutla Port Constr. Proj. Bids Feb. 20. CD 1/27.

▲† PANAMA—Bureau P. Rds., Dpt. Commerce, Inter-American Hys., 18 and F Sts., N.W. Wash. 25, D. C., U. S. A.

J. A. Jones Constr. Co., P. O. Box 966, Charlotte, N. C., U. S. A., LB $2,457,462. Proj. 16, Sect. 2, approx. 33 mi. grading, drainage, base course, bridges between Aguadulce and Santiago. Bids Apr. 20. CD 3/26.

PUERTO RICO

HEAVY CONSTRUCTION—BA

† Cuba, Guantanamo Bay—PIPE LINES—BA 6/5—Dist. P. Wks. Office, 10th Naval Dist., U. S. Naval Station, San Juan, Puerto Rico, cross bay pipe lines, U. S. Naval Base, NBy-1426, Nav. Docks Spec. 1425-56. Plans deposit $150.

BUILDINGS—BA

† Puerto Rico, Ponca—TRAINING CENTER—BA On Or About 6/19—U. S. Eng., P. O. Box 4970, Jacksonville, Fla., U. S. Army Reserve Training Center, ENG-08-123-56-63.

PROPOSED PROJECTS

WATER SUPPLY

Iowa, West Burlington—Town, Opal Fry, clk., water distr. sys. extens., imprvs., sewer extens., etc. $100,000.

Minn., Preston—Village, C. P. Grebin, clk., WW imprvs., drill new well, install water softening equip., connecting dead end mains, valving present sys., main extens., install water meters, $100,000. Davy Eng. Co., 524 Main St., LaCrosse, Wis., consult. engr. CD 12/22.

N. Y., Amherst—Village, Town Hall, Water Dist. No. 9, incl. water lines in Millersport Hy. and Campbell Blvd. up to French Rd. $235,000.

▲ O., Batavia—Comrs. Clermont Co., Court House, water treatment plant, distr. sys. $1,500,000. J. H. Fuller, 202 Wooster Park, Cincinnati, consult. engr. CD 8/3/54.

S. D., Mobridge—City, water sys. $600,000. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., consult. engr.

▲ Tex., Irving—City, City Hall, voted bonds Apr. 24, c.i. water lines, $1,716,000; water storage, $150,000; WW sys. rehabilitation, $100,000. CD 4/17.

▲ Tex., Lubbock—City, City Hall, 52 mi. 45 in. water supply line from Shallowater to Muleshoe. $2,000,000. John Hickerson, city engr. CD 11/16.

▲ Wash., Port Townsend—City, City Hall, Port Townsend, rehabilitating supply line. $2,200,000. Financing plan approved. CD 12/19.

Alaska, Juneau—City, City Hall, defeated bonds Apr. 24 expand supply and distr. sys. $625,000. CD 4/12.

SEWERS, WASTE DISPOSAL

▲ Ala., Decatur—City, City Hall, sewerage sys. in Southeast Decatur. $1,000,000.

Colo., Grand Junction—City, City Hall, voted bonds sewerage sys. imprvs., incl. new lines and new sewage plant, $744,791. Herkenhoff-Turney, 302 E. Palace Ave., Santa Fe, N. M., consult. engr. and archt. CD 3/27.

Conn., Oakville—Oakville Fire District, Oakville, sewer trunk line, $450,000.

▲ La., Westwego—Mayor, sewerage sys. $2,000,000. Fromherz Eng., 816 Howard Ave., New Orleans, consult. engr. (Correction-engineer). CD 4/26.

Mich., North Muskegon—City, Anne M. Kueny, clk., storm sewer, paving, West Side District, Fowler St.

(Continued on page 158)

Santa Fe

road crews find they can move more dirt on rubber

D Tournapull is easy to operate in either sand or hardpan. It's very maneuverable, crosses tracks and travels on the roadbed easily. The short turning radius allows the machine to work in tight places.

To clean out blow-sand from the right-of-way near a highway overpass 5 miles west of Los Lunas, N. M., the Santa Fe Railroad put a D Tournapull to work in this hard-to-handle material.

The rubber-tired "D" was push-loaded by a TD-14A. Despite the hard-to-load nature of the loose sand and poor footing, the D Tournapull averaged 21 trips per hr. over the 1000′ cycle.

The "D" loaded in 75 ft., hauled 650 ft., spread on the run in 75 ft. and returned by shortcut of 350 feet. Average load was 5 yds.; cycle time, 2 min., 40 sec. Production: 105 yds. per 55-min. hour.

On the job reports show that under good conditions the "D" has averaged up to 1250 yds. in 8 hrs.

Sand no menace to bearings

In spite of extensive operation in sand, no wheel-bearing repair or replacement has been needed on any of the 3 D Tournapulls currently operating on the Santa Fe. The "D's" have needed practically no maintenance except for regular lubrication and mechanical check.

What the men who work them say

"The LeTourneau-Westinghouse D Tournapull has a short turning radius (13′), and we can cross tracks without placing ties between the rails. We have found that we can move large quantities of dirt with this rubber-tired rig and it is especially useful on the longer hauls where it saves time."

You, too, can benefit with our modern, high-speed machines that haul more yards per hour. Why not write us now for the new railroad bulletin that gives complete information on the D Tournapull applications for your work? We'll be glad to arrange a demonstration.

"The Railroad Handyman" FREE

20-page book shows how 7-yd. self-loading "D" cuts time and costs on right-of-way maintenance. Send for your free copy. No obligation. Also ask to see our interesting color movie, "Clear The Track".

Tournapull—Trademark Reg. U.S. Pat. Off. DP-923-RR-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

(Continued from page 156)

to Gerber Rd. $135,000, Alfred Hanson, 402 Michigan Theatre Bldg., Muskegon, consult. engr.

Mo., Stover—City, sewerage sys. $112,000. Capitol Eng. Co., 921 Madison St., Jefferson City, consult. engrs. CD 3/30.

N. J., Burlington—City, City Hall, drainage diversion sewer, to divert storm water in South Burlington, $105,000. Sherman, Taylor & Sleeper, 501 Cooper St., Camden, consult. engrs.

N. J., Westville—Oak Valley Sewerage Co., 1 S. Broad St., Woodbury, plans by Dante J. D'Anastasio, 1815 Federal St., Camden, sewerage disposal plant and sewerage sys., Oak Valley Tracts, Ogden Rd., Mantua-Woodbury Rd., Deptford Twp. $150,000. Chas. P. Caulfield, 61 S. Broadway, Pitman, consult. engr.

N. Y., Syracuse—Onondaga County Water Auth., P. O. Box 1004, plans by O'Brien & Gere, 400 E. Genesee St., DeWittshire Sewer Dist. imprvs. to existing lines, incl. addns., Town of DeWitt, $445,000; Nine Mile Creek Sanitary Dist., new sewerage sys., Town of Camillus. $395,000.

O., Cincinnati—City, City Hall, incinerator plant alterations, Crookshank Rd. $150,000. Bids late 1956. Edward Sobolewski, 2065 Francis Lane, consult. engr. CD 11/7/52.

O., St. Marys—City, sewage disposal plant, $497,000. Floyd G. Browne & Assocs., 123 W. Church St., Marion, consult. engrs.

▲ **Pa., Reading**—City, City Hall, voted $4,500,000 bonds Apr. 24, sewage disposal sys., imprvs., and installation addnl. sewerage lines, CD 4/27.

Tex., Channelview—Harris Co. Fresh Water Supply Dist. No. 6, Channelview, sanitary sewer collection lines, $75,000; sewage disposal plant unit, $80,000. Hilton & Coulson, 3821 Fannin St., Houston, consult. engrs. CD 4/17.

Tex., Corpus Christi—Edwin Flato Co., 2022 Laredo St., sanitary sewers, $80,000; storm sewers, $75,000. in "Tropic Isles".

Tex., Fort Worth—Odell Moore, 6382 Greenway Rd., sanitary sewers, $75,000; storm sewers, $75,000, Brooks-Mooreland Addn.

Tex., Houston—Akard Beall, 2025 Stillwood St., storm sewers, $75,000; sanitary sewers, $76,500, in Campbell Woods, Sect. 2.

Tex., Houston—J. A. Hamilton, et al, 4705 Pease St., sanitary-storm sewers, 239-acre tract, Kuykendall Rd. $110,000.

▲ **Tex., Irving**—City, City Hall, voted bonds Apr. 24, storm sewers, $400,000; sanitary sewer lines, $1,250,000; sewage disposal plant, $165,000; sanitary sewerage sys. rehabilitation work, $90,000. CD 4/17.

Tex., Mesquite—Big Town Corp., c/o Gerri Von Frellick, Equitable Bldg., Denver, Colo, sanitary storm sewers, "Big Town", 75-acre site. $100,000.

Tex., San Antonio—Olmos Lumber Co., c/o Jimmy Stroll, 2818 N. McCullough Ave., storm sewers, $75,000; sanitary sewers, $75,000, in Ridgewiew Subdivision.

Wis., Kewaunee—City, City Hall, sewage treatment plant and intercepting sewers, $358,909. J. Donohue Eng. Co., 606 N. 8 St., Sheboygan, engr.

BRIDGES

Ind., Fort Wayne—Comrs. Allen Co., Court House, bridge over St. Mary's River linking Lafayette St. and Spy Run Ave. $300,000. W. A. Darling & Assoc., Inc., 414 Transfer St., consult. engr.

N. J., Jersey City—Bd. Freeholders Hudson Co., Court House, four-lane Park Ave. viaduct between Hoboken and Weehawken. $660,000. Harry J. Thourot, co. engr.

▲ **New York and New Jersey**—Baltimore & Ohio R.R. Co., Charles and Baltimore Sts., Baltimore, Md., 558 ft. vertical lift bridge over Arthur Kill Channel from Staten Island, N. Y. and Elizabeth, N. J. $10,000,000. Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, N. Y., consult. engrs. Alec Mitchell, St. George, N. Y., resident engr. for owner.

Tex., Irving—City, City Hall, voted bonds Apr. 24, bridge, $200,000. CD 4/17.

▲ **WEST VIRGINIA**—State Roads Comn., Charleston, high level bridge over West Branch of Ohio River from Wheeling Island, W. Va. to Bridgeport, O. $10,000,000. Plans to be completed in December. Hardesty & Hanover, 101 Park Ave., New York, N. Y. consult. engrs.

STREETS AND ROADS

Ala., Cullman—City, City Hall, paving 50 blocks of city streets. $236,000. Vernon Palgett, city engr.

Ala., Decatur—City, City Hall, street paving. $300,000.

▲ **Ala., Demopolis**—City, City Hall, street paving exten., gas and water sys., enlarging sewerage sys. $1,100,000.

Mich., Madison Heights—City, Donald V. Smith, mgr., Madison Heights, pave part of 40 mi. streets, pave streets south of Lincoln, $500,000. James Selle, city engr.

Neb., Lincoln—City, City Hall, imprv. 9th St. to maximum usage from T St. to Van Dorn St. $107,400. Carl Fisher, city engr. CD 11/8/54.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15, **Erie Co.**—12 mi. by-pass Rte. 6 around Sandusky. $6,500,000. Sanzenbacher, Miller & Brigham, 3023 Sylvania St., Toledo, consult. engrs.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, **Lincoln Co.**—widen, resurf. U. S. 66 through Stroud. $400,000. G. H. Bittle, c/o owner, engr.

Okla., Ardmore—City, voted bonds Apr. 17, highway widening. $200,000. Joe E. Taylor, c/o owner, engr. CD 3/30.

Tex., Brownfield—Terry Co., Brownfield, voted bonds Apr. 21, roads. $250,000.

▲ **Tex., Brownsville**—Cameron Co., Court House, bond election May 26, county roads, Precinct Nos. 1, 2, 3 and 4. $843,750 each. CD 8/1.

Tex., Irving—City, City Hall, voted bonds Apr. 24, street imprvs., paving, $600,000. CD 4/17.

Tex., Mesquite—Big Town Corp., c/o Gerri Von Frellick, Equitable Bldg., Denver, Colo., area paving and hard paved auto parking center for 4,630 cars, "Big Town" 75-acre site. $200,000.

▲ **Ont., Long Branch**—Village, 1560 Lake Shore Rd., 5-year program paving, storm sewers in various locations, $1,895,000.

EARTHWORK, WATERWAYS

Michigan—State, Waterways Comn., Fred B. Lifton, dir., 417 W. Michigan St., Lansing, 1,000 ft. causeway into Lake Huron, dock will provide slips for 20 small water craft, Harbor Beach, Huron Co., $65,000; breakwater and boat slips, Lake Michigan, Muskegon, Muskegon Co., $100,000.

N. J., Hackensack—Bergen County Park Comn., Court House, imprv. lands, straightening stream to end that the Park will serve as recreation area as well as a reduced flood hazards along river in basin of Saddle River, through Paramus, Saddle River, Fair Lawn, Ho-Ho-kus, $250,000. Roscoe McClave, 600 Gorge Rd., Cliffside Park, co. engr. Anthony Lunetta, 2329 Hudson Terrace, Coytesville, hydraulic engr.

Tex., Lubbock—Lubbock County Water Control & Imprvt. Dist. 1, Lubbock, voted bonds Apr. 17, constr. dam and facilities toward establishing a recreation lake, cover 217-acres, 6¼ mi. shoreline, dam storing 5,000 acre ft. water, $600,000. CD 6/9/54.

AIRPORTS

▲ **Calif., Los Angeles**—OVERHAUL and MAINTENANCE BASE—Continental Air Lines, Stapleton Airfield, Denver 7, Colo., plans by Pereira & Luckman, 9220 Sunset Blvd., Zone 26, overhaul and maintenance base at Los Angeles International Airport. $4,500,000. First section to begin in August.

▲ **Ill., Chicago**—AIR TERMINAL—Paul Butler, c/o Butler Aviation Co., 223 S. Monroe St., plans by Shaw, Metz & Dolio, 208 S. La Salle St., 27 story, steel, glass, stone air terminal bldg., offices, hotel, Monroe and Wacker Dr. $12,000,000.

† **Kan., Wichita**—METAL BUILDING—Boeing Airplane Co., Plant No. 11, Personnel Bldg., 36,000 sq. ft. metal bldg. for Air Force, $500,000, Wilson & Co., 705 E. Crawford St., Salina, consult. engrs.

▲† **Va., Gravelly Point**—AIRPORT—General Services Admin., P. Bldgs. Service, 18 and F Sts. N. W., Wash. 25, D. C., National Airport Imprvt. Program, incl. addnl. baggage room, 4 or 5 gate positions, field lighting, addnl. airplane taxiway, high-speed turnoffs, underground gasoline storage facilities. $3,000,000. CD 2/6.

Wash., Seattle—BUILDING—Port of Seattle, Bell St. Terminal, plans by Young, Richardson, Carleton & Detlie, Central Bldg., Zone 4, 25,750 sq. ft. building to be leased to Post Office Dpt. for handling overseas air mail for armed services at Seattle-Tacoma International Airport, $450,000. Bids in July. CD 9/15.

Alaska, Juneau—AIRPORT—City, City Hall, voted $125,000 bond Apr. 24, municipal airport expansions. $500,000. CD 4/12.

LATIN AMERICA

▲ **Mexico, Acapulco**—Junta Federal de Mejoras Materiales, Acapulco, plans street imprvs. $1,600,000.

FOREIGN

▲ **Egypt, Cairo**—AIR TERMINAL—Civil Aviation Department, Cairo, plans by Mustafa Shawky & Salah Zeitoon, Cairo, air terminal. $3,000,000. Bids in November.

▲ **Netherlands West Indies**—Govt. of Netherlands West Indies, Aruba, plans two plants to distill drinking water from the sea and to produce 3,200 kw. electrical power on Island of Curacao. $1,200,000.

PUBLIC BUILDINGS

▲ **Calif., Fullerton**—SCHOOLS—Fullerton School Dist., Fullerton, plans by Smith, Powell & Morgridge, 208 W. 8 St., Los Angeles, 1 story, frame, stucco Hermosa School $350,000; 1 story, frame, stucco Pacific School $350,000; 1 story, frame, stucco Acacia School $350,000. CD 3/4/55.

▲ **Calif., Hayward**—SCHOOL—Hayward Union High School Dist., 22300 Foothill Blvd., Cherryland High School $1,790,750. CD 2/20.

Calif., San Francisco—WAREHOUSE—City and San Francisco Co., Div. P. Wks., City Hall, warehouse for housing 1,500 voting machines. $530,000. CD 11/6/53.

▲ **Calif., San Jose**—SCHOOL—Mt. Pleasant Elementary School Dist., 14275 Candler Ave., voted bonds, school, Story Rd. near Roehampton Ave. $1,200,000. CD 2/28.

▲ **Calif., Sonora**—SCHOOLS—Sonora Union High School Dist., Sonora, bond election June 12, high school addns. $1,250,000. Extended bond election date. CD 4/20.

▲ **Colo., Boulder**—CHEMISTRY—University of Colorado, Campus, Boulder, plans by Trautwein & Howard, consult. engrs.-archts., 1411 Walnut St., Phila. 2, Pa., 1 story chemistry bldg. $1,400,000. CD 12/23.

▲ **Colo., Grand Junction**—HOSPITAL, etc.—State of Colorado, State Home & Training School, Grand Junction, plans by Eugene D. Sternberg, consult. engr.-archt., 2364 E. 3 St., Denver, hospital and infirmary. $2,140,000. CD 12/2.

Conn., Hartford—COUNTY—Comrs. Hartford Co. 95 Washington St., plans by Julius Berenson & Clifton C. West, 48 Forest St., Hartford County Bldg. addn. $350,000. Bids in May. Robt. W. Loomis, 32 Maple Ave., Windsor, consult. engr. Fred S. Dubin & Assoc., 178 S. Whitney St., owners' engr. CD 2/7.

▲ **Conn., New Haven**—HOUSING—State P. Wks. Dpt., 165 Capitol Ave., Hartford, moderate rental housing, incl. 300 units. $2,420,000. P. J. Carroll, c/o owner, engr.

Conn., Bristol—HOUSING—State P. Wks. Dpt., 165 Capitol Ave., Hartford, moderate rental housing, incl. 50 units. $605,000. P. J. Carroll, c/o owner, engr.

▲ **Conn., New Britain**—HOUSING—State P. Wks. Dpt., 165 Capitol Ave., Hartford, moderate rental housing, incl. 100 units. $1,210,000.

▲ **Conn., Waterbury**—HOUSING—State P. Wks. Dpt., 165 Capitol Ave., Hartford, moderate rental housing. $2,420,000. P. J. Carroll, c/o owner, engr.

▲ **Conn., Wethersfield**—CENTRAL OFFICE—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Henry F. Ludorf, 95 Elm St., Hartford, central office bldg., for State Highway Dpt. $2,000,000. Bids in May. CD 3/28/55, under LB.

Conn., Wethersfield—TOWN HALL, etc.—Town, Town Hall, plans by Jeter & Cook, 36 Pearl St., Hartford, town hall and library. $560,000. Ebbets, Frid & Prentice, 862 Asylum Ave., Hartford, consult. engrs. CD 2/28.

Fla., Key West—SCHOOL—Monroe Co. Bd. Instruction, Key West, plans by William H. Merrlam, 278 Aragon Ave., Coral Gables, Marathon High School, Marathon. $344,000.

† **Ga., Dawsonville**—PLANT ROADS, etc.—Dpt., Air Force, Pentagon Bldg., Wash. 25, D. C. 10 mi. roads, 2 bridges; 16 mi. perimeter fence incl. 40 ft. wide firebreak at Air Force Plant No. 6, for Lockheed Aircraft Corp., Marietta, Ga. Vitro Eng. Div., 225 4th Ave., New York 3, N. Y., consult. engr. CD 4/12.

† **Idaho, Arco**—BUILDING—Idaho Operations Office, Atomic Energy Comn., Idaho Falls, 32x80 ft. insulated prefab. steel bldg. with 20x40 ft. addn. and oil-fired hot air heating plant, Organic Moderated Reactor Experiment site at National Reactor Testing Station. $180,000. Bids next month. CD 3/24/49.

▲ **Ill., Chicago**—PARKING GARAGES—City, City Hall, 4 parking garages and 35 parking lots, Chicago and Ashland Sts.; North and Pulaski Sts.; Grand and Harlem Sts., Roosevelt and Kedzie Sts. $13,000,000. DeLeuw, Cather & Co., 150 N. Wacker Dr., consult. engrs. CD 2/21/50.

Ill., Eldorado—SCHOOL, etc.—Bd. Educ., Eldorado, plans by Lee Potter Smith & Assocs., Paducah, Ky., brick, concrete, steel gymnasium, vocational and music addn. to high school. $50,000.

Iowa, Marshalltown—SCHOOLS—Bd. Educ., George W. Short, secy., $980,000 bond election May 21, schools and addns., Anson Junior High School and Senior High School. Brooks-Borg, 815 Hubbell Bldg., Des Moines, archts. CD 4/12.

Kan., Dodge City—SCHOOL—School Dist. 1, Ford Co., plans by Gurtner & Robison, Dodge City, Northwest Elementary School. $350,000. CD 11/8/54.

Kan., Kansas City—GARAGE—City, City Hall, plans by C. E. Mullin, 1401 Fairfax Trafficway, Kansas City, Kan., city garage. $150,000.

▲ **Ky., Louisville**—OFFICE—State Div. Purchases, Frankfort, plans by Meriwether Marye & Assoc., 248 E. Short St., Lexington, 2 story, 150x220 ft. office for Dpt. Economic Security, $1,000,000-$1,250,000.

▲† **Mass., Cambridge**—ENERGY PARTICLE EXCELERATORS—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D. C., 6-billion electron volt high energy particle excelerators, to be operated by Harvard University and Mass. Institute of Technology at site near Harvard Cyclotron Laboratory. Project will incl. laboratory, office, shops, power supplies and experimental area. $6,500,000.

▲ **Mass., Westboro**—SCHOOL—Town, High School, plans by Rich & Tucker Assoc., 45 Newbury St., Boston, high school, Franklin Ave. and Fisher St., $1,200,000. Bids latter part of May. CD 2/15/55.

Mich., Clarenceville—SCHOOL—Bd. Educ., Clarenceville School Dist., Louis Schmidt, supt. Schools, voted $750,000 bonds Apr. 23, high school. CD 3/20.

Mich., Detroit—COMMUNITY CENTER—City, Parks & Recreation Comn., Howard Crowell, asst. supt., 1214 Griswold St., Heilman Community Center, incl. recreation bldg., indoor and outdoor swimming pool, State Fair and Crusade Sts. $650,000. M. F. Wagnitz, city engr. CD 2/21/55.

Mich., Riverview—MUNICIPAL CENTER—Village, James L. Hale, mgr., voted $400,000 bonds Apr. 23, municipal center, incl. village offices, public works, library, recreational facilities.

▲ **Minn., Duluth**—SCHOOLS—Bd. Educ., St. Louis Co., W. W. Salmi, supt. Court House, voted $1,070,000 bonds Apr. 9, school at Cook, $700,000; Palo-Markham Elementary School, 10 mi. south of Aurora, $370,000. CD 11/11 and 1/6, under Minn., Cook.

Minn., Fergus Falls—SCHOOL—Bd. Educ., A. A. Vollbrecht, clk., voted $850,000 bonds Apr. 24, school, school imprvs. Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, archts. CD 4/25.

▲ **Mo., Columbia**—HOSPITAL—Boone Co., $1,250,000 bond election May 29, hospital addn. CD 8/29/46.

(Continued on page 160)

How tractor-on-rubber speeds highway improvement work *in Ethiopia*

Excess earth is dozed into valleys where it will later be used to fill around trees and culverts. Big 4-wheel air-brakes give operator confidence to work safely near steep banks.

Earthmovers around the world have found the versatile 19 mph Tournatractor a handy tool on a wide range of dirtmoving assignments. Typical jobs and problems encountered by contractors in Chile, Iraq, or Malaya are usually quite similar to dirtmoving "headaches" in Maine, Texas, or California. For example, here's how 5 Tournatractors, working under adverse conditions, speed work assignments for the Imperial Government of Ethiopia.

To improve their national highway system the Ethiopian Government works 5 high-speed Tournatractors on a busy 12 month-a-year schedule. These rubber-tired tractors operate in rainy highlands, arid deserts, in near-freezing temperatures, and often in equatorial heat. Material ranges from wet mud to abrasive sand and rock . . . yet Tournatractors have proved efficient under all conditions.

Prevents landslides near Addis Ababa

The advantages of these versatile units are clearly illustrated by a recently-completed landscaping project near Addis Ababa. The job consisted of benching hills to keep landslides from blocking a modern all-weather asphalted highway which circles the mountains around the city.

Tournatractor strips heavy sod and levels subsoil to prepare athletic field for a police training school. Rolling action of big low-pressure tires help compact material.

Tournatractor worked at more than 8400 feet above sea level to doze a mixture of loam, decayed top vegetation, and dry, hard red clay. It dug out many deeply rooted stumps which dotted the area. It crossed pavement and traveled along the highway without damaging the bituminous surface. Its mobility, plus high rate of production, enabled the unit to complete the project well ahead of schedule. Government officials say this *one* rubber-tired Tournatractor did the work in *one-third* less time than could a combination of *two* crawler-tractors.

Levels 2500 cu. yds. in 40 hours

Another of the Government's Tournatractors performed equally well when it stripped and leveled a new athletic field for the Ethiopian Police Training School near Addis Ababa. In five 8-hour days, this machine moved 2500 cubic yards of earth and sod. Total included all rough and final dozing; even some finish-grading.

Meanwhile, the third Tournatractor stockpiled materials for highway surfacing. At the same time, the fourth and fifth Tournatractors, equipped with power control units, pulled 11-yard LeTourneau-Westinghouse Scrapers to build shoulders and drainage ditches along highways.

From time to time as needed, the 19 mph Tournatractors took time off from other assignments to pull LeTourneau-Westinghouse Rooters that ripped old bituminous road surfacing before retopping.

Tractor-on-rubber speeds can help cut costs and save time on your earthmoving, too. Ask your LeTourneau-Westinghouse Distributor to help you estimate savings possible on your operation.

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Address .....

(Continued from page 158)

▲ **Mo., Kansas City**—LIBRARY—Bd. Educ., Library Bldg., Kansas City, voted bonds May 1, main library, 2 new branch libraries, remodeling 12 branches, $6,000,000. CD 3/7.

▲ **Mo., Kansas City**—SCHOOLS—Bd. Educ., Library Bldg. voted bonds, May 1, schools $21,000,000. CD 3/7.

Mo., Kansas City—TRAINING CENTER—National Guard, Memorial Bldg., Kansas City, Mo., Naval and Marine Corps. Training Center, Brush Creek Blvd. and Agnes St. $750,000.

▲ **Mo., St. Louis**—WORKHOUSE—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market St., Zone 3, plans by Russell, Mulligardt, Schwartz & Van Hoefen, 721 Olive St., Zone 1, and George W. Aderhold, consult. archt., 513 N. Broadway, Oklahoma City, Okla., brick, concrete, steel warehouse, $3,000,000 Otto Heinicke & Co., 122 N. 7 St., Zone 1, struc. engrs. Ferris & Hamig, 1706 Olive St., Zone 3, mech. engrs. CD 6/7.

▲ **Mont., Kalispell**—COURTHOUSE, etc.—Flathead Co., Court House, plans by Richard Taylor, Ford Block, 2 story, courthouse and jail. $1,200,000. Bond election Nov. 6.

Neb., Lincoln—WAREHOUSE, etc.—Bd. Educ., 720 S. 22 St., warehouse and maintenance bldg. $100,000. CD 2/15/55.

N. J., Edison—SCHOOL—Bd. Educ., Raritan Twp., Edison, plans by Alexander J. Merchant, 1 Elm Row, New Brunswick, Washington School, Raritan Twp. $400,000. Bids in September. CD 3/26.

N. J., Hackettstown—HOSPITAL—Bd. Trustees Community Hospital, Hackettstown, 50-bed hospital, 30-acre site in Willow Grove St. $400,000.

▲ **N. J., Manahawken**—SCHOOL—Long Beach Island School Bd., Harvey Cedars, bond election May 31. Regional Junior-Senior High School. $1,200,000. F. Herbert Radey, 8 and Market Sts., Camden, archt. CD 2/13.

▲† **N. J., Princeton**—RESEARCH CENTER—Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash. 25, D. C., 3billion electron volts high energy particle excelerators, at Forrestal Research Center to be operated by Princeton University and the University of Pennsylvania. Project will incl. laboratory, office, shop, power facilities and experimental area. $5,800,000.

N. Y., Port Washington—ADMINISTRATION, etc.—Port Washington Sewer Dist., admin bldg., garage, machine shop and pump station. $190,000.

O., Chagrin Falls—SCHOOL—Bd. Educ., Chagrin Falls, bond election June 26, high school. $500,000. Mellenbrook, Foley & Scott, 20 Beach St., Berea, archts. CD 2/1.

O., Cincinnati—MUSIC HALL—City, City Hall, rehabilitation of music hall Elm St., North Hall alterations. $650,000. Edward Sobolewski, 2065 Francis Lane, consult. engr. Ed. Potts, supt., prop. maintenance.

▲ **O., Columbus**—HOSPITAL WING, etc.—Ohio State University, N. High St., north wing to University Hospital, $3,000,000; radiation therapy bldg., connecting link with dental bldg., and remodeling present hospital, $680,000.

▲ **O., Columbus**—STATE SCHOOL—State Dpt. Mental Hygiene & Correction, Dr. John D. Porterfield, dir., State Office Bldg., Zone 16, plans by Damon, Worley, Samuels & Assoc., Engineers Bldg., Cleveland, Zone 14, centralized food preparation and service units, $1,400,000; plans by Tibbals-Crumley-Musson, 965 E. Broad St., completion 150-bed reception and diagnostic center, $650,000, Columbus State School. CD 1/12.

O., Fremont—COUNTY HOME FOR AGED—Comrs. Sandusky Co., Court House, $750,000 bond election Nov. 6, Sandusky County Home for Aged. CD 4/6.

O., Gallipolis—HOSPITAL—State Dpt. Mental Hygiene & Correction, Dr. John D. Porterfield, dir., State Office Bldg., Columbus, Zone 16, plans by Ramsey, Croce & Abbot, 490 City Park, Columbus, 100-bed medical-surgical bldg., Gallipolis State Hospital. $750,000. CD 1/12.

O., Kent—SPEECH-MUSIC—State Dpt. P. Wks., State Dpts. Bldg., Columbus, plans by Mellenbrook, Foley & Scott, 20 Beech St., Berea, speech and music bldg., Kent State University.

O., Tiffin—HOSPITAL—State Dpt. Mental Hygiene & Correction, Dr. John D. Porterfield, dir., State Office Bldg., Columbus, Zone 16, plans by Sims, Cornelius & Schooley, 2901 N. High St., Columbus, 120-bed reception and therapy unit, Tiffin State Hospital. $750,000. CD 1/12.

O., Toledo—HOSPITAL—State Dpt. Mental Hygiene & Correction, Dr. John D. Porterfield, dir., State Office Bldg., Columbus, Zone 16, plans by British-Macelwane & Assocs., 2450 Sylvania St., 100 bed addn. to receiving hospital and therapy unit, Toledo State Hospital. $500,000. CD 1/12.

▲ **Okla., Muskogee**—SCHOOLS—Bd. Educ., Muskogee, voted bonds Apr. 17, schools. $1,500,000. Fred Zaroor, Muskogee, archt. CD 4/5.

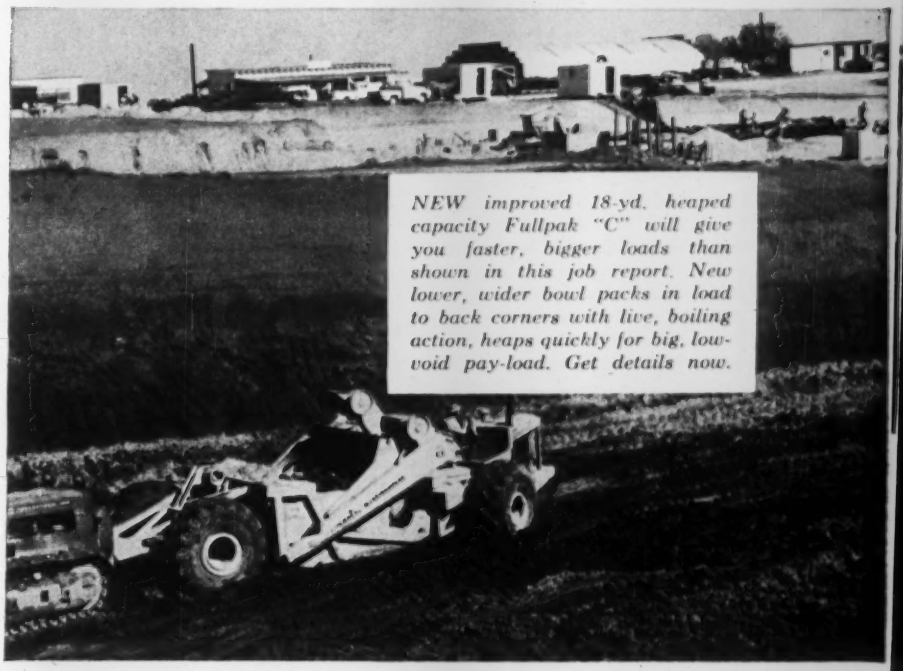
Tex., Denison—SCHOOLS—Denison Independent School Dist., Denison, voted bonds, group school addns. $464,000; school, Hyde Park-Ellsworth area, $400,000; steam heating plant sys. $100,000. CD 2/18/53.

▲ **Tex., Fort Worth**—SCHOOLS—Fort Worth Public Schools, Ed. P. Williams, bus. mgr., 3210 W. Lancaster St., plans by Charles E. Armstrong, 1013½ University Dr., 1 story Eastlands St. Elementary School, 4016 Eastland St. $450,000; plans by Harkrider, Clark & Jones, 1004 T. & P. Bldg., 1 story

(Continued on page 162)

How Miller Excavating Co.

hauled mud from 10 feet below water level


NEW improved 18-yd. heaped capacity Fullpak "C" will give you faster, bigger loads than shown in this job report. New lower, wider bowl packs in load to back corners with live, boiling action, heaps quickly for big, low-void pay-load. Get details now.

Pushed 120 feet by a 190 hp crawler, C Tournapull loads better than 11 pay yards of heavy, wet marl. The "C's" working 8 hours per day, 6 days per week, on this excavation project experienced no downtime for repairs during two months continuous operation.

Excavating 280,000 yards for an underground, U.S. Air Force building, Miller Excavating Company, Omaha, Nebraska, faced the problem of deep cuts in wet clay and steep adverse grades. The company assigned this job to 2 C Tournapulls, a 20-yard tractor-drawn scraper, a dragline, and a 190-hp crawler-pusher.

Machines went to work moving the wet clay and loam so the foundation slab for this three-story building could be laid 10 feet below ground-water level. The deeper the hole was dug, the wetter it became, and the harder to work. Even though the pit was drained by a wellpoint system, material at the bottom of the excavation was soft and slippery. To make matters worse, frequent showers added to the rough going.

"C's" handle mud easily

Traveling through this mud, each of the "C's" averaged a 1000′ cycle in 9 minutes. 132 pay yards were delivered by the 2 units in an average 55-minute hour.

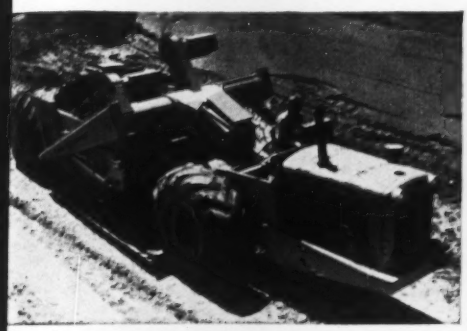
The two "C's" moved 70% of the 280,000 yards involved. 30% was moved by a 20-yard tractor-drawn scraper loaded by dragline.

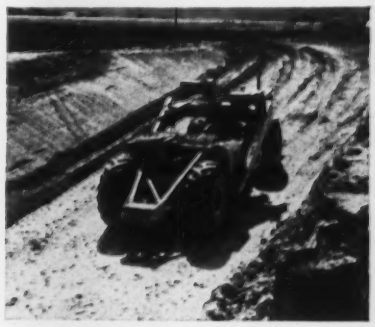
In the poor footing, Tournapulls' exclusive power-proportioning differential automatically transferred power to the wheel with firmer footing. In extremely slippery underfoot conditions, operator also used Tournapulls' electric power-steer through geared king-pin to pivot prime-mover in alternate directions, "walking" his machine to firmer ground. Steer can swing prime-mover up to 90°.

Compact fill in normal travel

Once out on the fill, "C's" spread full loads over a distance of 71′ in 40 seconds. "C's" big rubber tires helped to compact fill, building a firm surface in ordinary travel.

Says Operator Wm. Welch, "Tournapull is a good machine. This job is rough, but Tournapulls move a lot of earth, handle loads easily."





Working in second gear, C Tournapull hauls 11 pay yards of very heavy wet marl up a steep, slippery grade in this excavation for a three-story, underground office building.

Get the full story

The experience reported here is one of many showing how Tournapulls' rubber-tired speed, electric power-steer, and power-proportioning differential assures lowest-net-cost-per-yard under all job conditions. Write or call your LeTourneau-Westinghouse Distributor for details.

Tournapull—Trademark Reg. U.S. Pat. Off. P-886-P-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

(Continued from page 160)

Burton Hill Elementary School; 519 Burton Hill Rd., $450,000; plans by Hubert Hammond Crane, 3711 Camp Bowie Blvd., 1 story Strickland Rd. Elementary School, Strickland Rd. $370,476; plans by Preston M. Geren, 1607 Fort Worth Natl. Bldg., 2 story masonry Dunbar Elementary School, 5100 Willie St. $572,800; plans by Wyatt C. Hedrick Co., 1200 T & P Bldg., 1 story masonry Rosedale Park Elementary School, 5800 Rickenbacker Pl., $450,000; plans by Wm. Lane, 555 S. Lake St., 1 story Bonnie Brae Elementary School, $370,470; plans by A. C. McAdams, 256 Majestic Bldg., 2 story M. H. Moore Elementary School, 1801 N. E. 36 St., $529,300; plans by Joseph R. Pelich, 1203 Commercial Std. Bldg., 2 story masonry High School, Weiler Blvd. and Meadowbrook, $900,000; plans by Jim Vowell, Electric Bldg., 1 story, masonry Ridglea Hills Elementary School 4517 Angus Dr. $450,000; plans by Wilson, Patterson & Assocs., 601 Bailey St., 1 story masonry Greenbriar Elementary School, 5717 James St. $507,000; plans by Robert P. Woltz, Jr., 1030 7th Ave., 1 story masonry, Carter Park Elementary School, 1216 E. Broadus St., $450,000. CD 4/13.

▲ **Tex., Garland**—SCHOOLS—Garland Independent School Dist., Garland, Junior High School, $750,000; elementary school, $400,000; school repairs (group), $350,000. CD 2/17/54.

Tex., Irving—PUBLIC BLDGS.—City, voted bonds Apr. 24, group of public bldgs. $500,000. CD 4/17.

▲ **Tex., Lufkin**—SCHOOLS—Lufkin Independent School Dist., Lufkin, Elementary Schools, No. 1, $350,000; No. 2, $350,000; No. 3, $350,000. CD 11/21/52.

▲ **Tex., Midland**—HIGH SCHOOL—Midland Independent School Dist., Midland, plans by Preston M. Geren, 1607 Fort Worth Natl. Bank Bldg., Fort Worth, high school addn., 800 W. Illinois St. $1,007,707. CD 1/25.

▲ **Tex., Paris**—HIGH SCHOOL—Paris Independent School Dist., Paris, voted bonds Apr. 17, Senior High School. $1,000,000. CD 4/18.

▲ **Tex., San Antonio**—HOUSING—San Antonio Housing Auth., 400 Labor St., plans by Phelps & DeWees & Simmons, 342 W. Woodlawn St., Noonan, Thompson & Krocher, Box 8308, Laurel Heights Station, and Marmon-Mok, 613 South Texas Bldg., 455 low-rent housing units, $4,000,000. CD 10/24/49.

Tex., Stanton—SCHOOL—Stanton Independent School Dist., Stanton, school. $350,000.

▲ **Utah, Ogden**—SCHOOLS—Bd. Educ., 2351 Grant Ave., voted bonds Apr. 24, schools. $2,500,000. CD 4/13.

▲ **Utah, Ogden**—SCHOOLS—Odgen City School Bd., 2351 Grant Ave., plans by Keith Wilcox, 427 Keisel Bldg., Junior High School, southeast Ogden, $1,000,000; plans by Hodgson & Holbrook Eccls, Ogden, Lewis Elementary School, $1,000,000; plans by Grix, Muller, Plowgian, Washington Terrace, Grandview Acres Elementary School $350,000-$400,000; plans by John Piers, 2726 Harrison Blvd., Hillcrest Elementary School, north sect. of city, $350,000. CD 5/2.

▲ **Utah, Salt Lake City**—SCHOOLS—Bd. Educ., 440 E. First South St., voted bonds Apr. 24, schools. $7,500,000. CD 4/6.

Wash., Silverdale—SCHOOL—School Dist. 401, Silverdale, plans by Jensen & Mills, 308 S. Tacoma St., Tacoma, Junior High School $350,000. Election Sept. 4 on special levy to finance.

▲ **Wis., Chippewa Falls**—SCHOOL—Bd. Educ., Chippewa Falls, plans by Lang & Raugland, 802 Wesley Temple Bldg., Minneapolis, Min., 2 story Senior High School. $1,600,000. CD 8/23.

Alaska, Ketchikan—WAREHOUSE—City, City Hall, voted bonds Feb. 21, utilities warehouse. $150,000. R. W. Beck & Assocs., Tower Bldg., Seattle 1, Wash. consult. engrs. CD 2/6.

N. B., Moncton—SCHOOL—School Trustees, Moncton High School, Moncton, school for Parkton subdivision, $400,000.

▲ **Ont., Joyceville**—PENITENTIARY—Dpt. Justice, Justice Bldg., Ottawa, penitentiary. Over $1,000,000. Lt. Col. R. W. Catto, c/o owner, ch. engr.

Ont., Toronto—RECREATION CENTER—City, City Hall, recreation center, incl. indoor swimming pool, Grange Park. $665,000.

Ont., Toronto—COLLEGIATE INSTITUTE—Etobicoke Bd. Educ., 4969 Dundas St. W., plans by Gordon S. Adamson & Assocs., 52 St. Clair Ave. E., 1 and partly 2 story, open court centre, 60,000 sq. ft., steel, Thistletown Collegiate Institute, $900,000. Onasick & McMurty, 416 Bloor St. E., consult. engrs.

Que., Montreal—SCHOOL—Montreal Catholic School Comn., 117 St. Catherine St. W., plans by Crevier, Lemieux & Mercier, 1065 Pratt Ave., Outremont, superior school for girls, $675,000.

COMMERCIAL BUILDINGS

Calif., Anaheim—DWELLINGS—Ragene Homes, Inc., 2185 California St., San Marino, plans by Hoegee & Walters, 177 W. San Berardino Rd., Covina, 50 frame, stucco dwellings, Tract 2913, Baxter St. and Romney Dr. $500,000.

Calif., Pacoima—DWELLINGS—Lakeview Terrace Homes, 221 S. La Brea Ave., Los Angeles, 78 frame, stucco dwellings, Dronfield and Pierce Sts. $800,000.

▲ **Calif., Pine Grove**—DIAL—Pacific Telephone & Telegraph Co., 140 New Montgomery St., San Francisco, 1 story, 72x92 ft., telephone dial bldg., replacing dial bldg. at Orinda Village. $1,000,000.

▲ **Calif., San Mateo**—COLLEGE—College of San Mateo Business Office, Delaware and Peninsula Aves., plans by John C. Warnecke, 111 New Montgomery St., San Francisco, college, incl. 4 buildings, stadium parking area and horticultural area and facilities. $8,000,000.

▲ **Conn., Bridgeport**—TELEPHONE OFFICE—Southern New England Telephone Co., 227 Church St., New Haven, plans by Harold H. Davis, 29 Whitney Ave., New Haven, 7 story office. $3,000,000. CD 1/9/53.

Conn., Fairfield—CHURCH—St. Pius X Parish, Rev. Francis X. McGuire, pastor, Fairfield, plans by J. Gerald Phelan, 211 State St., Bridgeport, church, Brookside Dr. $450,000. Fletcher-Thompson, Inc., 211 State St., Bridgeport, consult. engr. CD 4/20.

Conn., Manchester—HOUSING—Land Development Corp., Burnham St., 60-house development. $900,000.

Conn., Trumbull—CHURCH—St. Catherine of Sienna Parish, White Plains Rd., plans by J. Gerald Phelan, 211 State St., Bridgeport, church, $350,000.

▲ **Del., Wilmington**—APARTMENT—Pau-Mar Corp., c/o Harry Rubenstine, Equitable Trust Bldg., plans by John H. Graham, 2430 Pennsylvania Ave. N.W., Wash., D. C., 226-unit, Montchanin Apartment Building, 2401 Pennsylvania Ave. $4,500,000. CD 1/17.

Fla., Pompano Beach—APARTMENT—Peebles, Inc., Cross Rd., Ardsley, N. Y., plans by Wm. T. Vaughn, 909 E. Las Olas Blvd., Fort Lauderdale, 56-unit apartment. $360,000. D. E. Britt Assocs., 309 S.E. 9 Ave., Ft. Lauderdale, consult. engrs.

Ill., Chicago—CHURCH—St. Pricilla's Roman Catholic Parish, 7000 Addison St., plans by Barry & Kay, 53 W. Jackson Blvd., church. $750,000.

▲ **Ill., Niles**—SHOPPING CENTER—Raymond L. Lutgert, 7900 S. Kilpatrick St., Chicago, plans by Sidney Morris & Assocs., 134 N. La Salle St., Chicago, Lawrencewood Shopping Center, incl. 45 units, blacktop paving at N.E. corner Waukegan and Doakton Sts. $10,000,000.

▲ **Iowa, Des Moines**—HOSPITAL, etc.—Iowa Methodist Hospital, 1200 Pleasant St., plans by Brooks-Borg, 815 Hubbell Bldg., hospital and old age nursing home, $1,300,000. CD 1/24.

Iowa, Dubuque—STORE—J. C. Penney Co., Inc., 330 W. 34 St., New York, N. Y., 4 story, bsmt., brick, concrete air-conditioned store in 800 block Main St. $350,000.

Kan., Mission—SCHOOL—Diocese of Kansas, 1228 Sandusky St., Kansas City, Kan., plans by Shaughnessy, Bower & Gramaldi, 13543 Broadway, Kansas City, Mo., Bishop Meige High School and athletic field on site of old Mission Golf Course. $950,000. Bids after 90 days. CD 11/1/54.

Kan., Wichita—SHOPPING CENTER—Owner, c/o Feagins, Kirsch & Feagins, archts., 4007 E. Kellogg St., 140,000 sq. ft. Meadow View Shopping Center, Ridge Rd. and Central St. $500,000.

Md., Baltimore—HEADQUARTERS—National Maritime Union (AFL-CIO), 1012 E. Baltimore St., Zone 2, 1 story, union headquarters bldg., Broadway and Fairmount Ave. $350,000.

Mass., Boston—RESIDENCE HALL—Simmons College, The Fenway, Boston, residence hall, U-shaped dormitory, Pilgrim Rd. and Brookline Ave. $500,000.

Mass., New Bedford—HOSPITAL—New Union Hospital, Willis and Pleasant Sts., plans by Leo L. Sheinfeld, 7 Water St., Boston, hospital addns., alterations, new surgical and x-ray dpts., boiler room, $500,000. Bids in July.

▲ **Mass., North Easton**—COMMUNITY CENTER—Stonehill College, Very Rev. F. J. Boland, CSC, pres., Washington St., plans by Emery J. Laliberte, 53 Moraine St., Brockton, community center, $1,500,000. CD 12/15/54.

▲ **Mass., West Springfield**—SHOPPING CENTER—Riverdale Shopping Center, Inc., c/o Al Mastroianni, 94 State St., Springfield, plans by Donald S. Gilman, 1433 Main St., Springfield, regional shopping center, incl. fifty seven 1 story 200,000 sq. ft. stores, Riverdale Rd. $1,600,000.

▲ **Mich., Ann Arbor**—SHOPPING CENTER—Ann Arbor Shopping Center, John J. Sharemet & Richard A. Connell, Jr., WHRV, Ann Arbor, shopping center, incl. 35 stores, parking area& Washtenaw Rd., 1 mi. east. $5,000,000.

▲ **Mont., Billings**—LIBRARY, etc.—Rocky Mountain College, Billings, library, science hall, women's dormitory, physical education bldg., student union, remodel existing bldgs. $1,500,000.

▲ **N. J., Bayonne**—HOMES—Nathan A. Matter, c/o Van Kull Homes, Inc., 564 Broadway, plans by William J. Martucci, 24 Walnut St., Newark, 91 homes in lower Bergen Point. $1,400,000-$2,000,000.

N. J., Elizabeth—CONVENT—St. Mary's Church, S. Broad and South Sts., plans by Neil J. Convery, 605 Broad St., Newark, 3 story, brick, limestone convent. $400,000. Work to start in June.

N. J., East Paterson—SCHOOL—St. Leo's Parish, Market St., plans by Thomas J. Camlet, 667 Main Ave., Passaic, grammar school. $400,000.

N. J., Newark—CLUB—Boys Club of Newark, Inc., 161 Littleton Ave., plans by Frank Grad & Sons, 11 Commerce St., club on present site of Hayes Park North at Broadway and North Arlington Ave. $500,000.

▲ **N. J., Newark**—HOSPITAL WING—Bd. Trustees St. Michael's Hospital, 306 High St., plans by Wm. Neumann & Sons, 587 Summit Ave., Jersey City, hospital wing. Over $1,000,000.

N. Y., Binghamton—HOTEL-MOTEL—Sheraton Corp. of America, 470 Atlantic Ave., Boston, Mass., plans by Samuel Glaser Assoc., (for preliminary studies), 105 Newbury St., Boston, Mass., hotel-motel, $500,000.

▲ **N. Y., Munsey Park**—DEPARTMENT STORE—Bonwit Teller, 721 Fifth Ave., New York, plans by Lathrop Douglass & Charles G. Anderson, 518 Fifth Ave., New York, Zone 18, 3 story department store, on 5¾ acre tract at Northern Blvd. and Port Washington Blvd., and parking area. $1,500,000.

N. Y., New York—BANK—Dollar Savings Bank, 148 St. and Third Ave., Zone 55, plans by Skidmore, Owings & Merrill, 575 Madison Ave., Zone 22, 1 story bank, 170 St. and Walton Ave., $750,000.

▲ **N. Y., New York**—OFFICE—Great American Insurance Co., 1 Liberty St., Zone 5, plans by Shreve Lamb & Harmon, 11 E. 44 St., Zone 17, interior changes to 26 story office, 28-36 Gold St., 91-101 John St. and 1-21 Cliff St. $1,500,000.

▲ **N. D., Minot**—HOSPITAL—Trinity Hospital, Minot, plans by Ellerbe & Co., E-1st Natl. Bank Bldg., St. Paul, Minn., hospital addn. $1,500,000. Bids after May 15. CD 5/27.

▲ **O., Cleveland**—OFFICE, etc.—Downtown Investment Co., c/o Roy C. Carpenter, 3030 Euclid Ave., 15 story, office and car parking bldg., E. 9th and Superior Ave. $10,000,000.

O., Kettering—HOMES—Lloyd E. Hawn, 616 Laurelwood St., Dayton, 20 brick, stone ranch style homes along Elderwood Dr. in Short Hills. $800,000.

O., Xenia—Y. M. C. A. BLDG.—Bd. Directors Young Mens Christian Assn., John May, pres., Xenia, Greene County Y. M. C. A. bldg. $650,000.

Okla., Tulsa—HOTEL—The Town House, 3949 Admiral Pl., 7 story hotel addn. $600,000.

Pa., Bensalem—SCHOOL—Our Lady of Fatima R. C. Church, Bensalem, plans by Fridy, Gauker, Truscott & Fridy, Inc., 1321 Arch St., Phila., school. $344,000.

▲ **Pa., Pittsburgh**—SHOPPING CENTER—J. J. Gumberg Co., Grant Bldg., plans by Arthur E. Tennyson, 666 Washington Rd., 1 story, brick, block, 75,000 sq. ft. Baldwin Shopping center, Baldwin Boro, $3,000,000.

Pa., Washington—EDUCATION—First Christian Church, W. Wheelings St., plans by Chas. J. Betts, 22 S. Downey St., Indianapolis, Ind., religious education bldg. $500,000.

S. C., Charleston—HOTEL, etc.—Fort Sumter Hotel, foot of King St., hotel addn., swimming pool. $500,000.

Tex., Beaumont—DOCTORS—The Altamont Corp., c/o Stone & Pitts, archts. and consult. engrs., 1872 Calder St., 3 and 4 story masonry doctors bldg. $350,000.

▲ **Tex., Corpus Christi**—DWELLINGS—Edwin Flato Co., 2022 Laredo St., 30 dwellings, $368,425; 35 dwellings, $382,165; 23 dwellings, $376,195; 20 dwellings, $362,500; 18 dwellings, $347,100; 26 dwellings, $379,500; 33 dwellings, $371,210, in "Tropic Isles".

▲ **Tex., Fort Worth**—DWELLINGS—Odell Moore, 6382 Greenway Rd., 18 dwellings, $345,000; 24 dwellings, $365,500; 28 dwellings, $377,625, in Brooks-Moore-land Addn.

Tex., Fort Worth—HOMES—Purvis & York, 2312 Lucas St., plans by Horton & Wright, 3328 W. 7th St., 365 homes, Second Sect. $400,000.

Tex., Fort Worth—SHOPPING CENTER—Purvis & York, 2312 Lucas St., brick, tile shopping center, air-conditioned, in Sect. 2, Jean Capers Addn. $500,000.

Tex., Fort Worth—SHOPPING CENTER—Purvis & York, 5171 River Oaks Blvd., shopping center, Jean Capers Addn. $500,000.

▲ **Tex., Fort Worth**—HOSPITAL—St. Josephs Hospital, Sister Mary Vincent, admin., 1400 Main St., plans by Joseph R. Pelich, 1203 Commercial Std. Bldg., 125-bed hospital addn. to be joined to main bldg. with facade, 2-wings, east wing 1 story; north wing 5 story with fdn. to carry 26 stories, brick, tile, concrete, E. Morphy St. $2,000,000. Bids in about 3 months.

▲ **Tex., Houston**—DWELLINGS—Akard Beall, 2025 Stillwood St., 17 dwellings, $365,500; 14 dwellings, $360,000; 20 dwellings, $369,925; 30 dwellings, $390,000, Campbell Woods, Sect. 2.

▲ **Tex., Houston**—DWELLINGS—Krist Hubert & Assocs., 5300 Aspen St., 12 dwellings, $360,000; 17 dwellings, $381,000; 16 dwellings, $375,500 in Sect. Willow Meadows Addn.

▲ **Tex., Houston**—OFFICE, etc.—Melvin A. Silverman & Bennett Rose, 2923 Shenandoah St., plans by Lloyd & Morgan, 4605 Montrose St., 10 story office over 5 story auto parking garage, $2,500,000; 5 story ramp auto parking garage, $500,000, between Travis and Milam Sts.

▲ **Tex., Houston**—DWELLINGS—Herman H. Zonana, 10340 Hempstead Hy., 20 dwellings, $368,200; 23 dwellings, $359,000; 18 dwellings, $348,000; 25 dwellings, $371,390, Campbell Woods Addn.

▲ **Tex., Mesquite**—SHOPPING CENTER—Big Town Corp., c/o Gerri Von Frellick, Equitable Bldg., Denver, Colo., small type regional shopping center, "Big Town" 75-acre site. $10,000,000.

Tex., Midland—Y.M.C.A. BUILDING—Young Men's Christian Assn., Midland, Y.M.C.A. bldg. $800,000. CD 4/8/53.

Tex., Odessa—DWELLINGS—Brown Development Co., 2711 Inwood St., Dallas, plans by Milam & Roper, 368 Casa Linda Plaza, Dallas, addnl. 25 dwellings, $375,000; addnl. 22 dwellings, $361,500.

▲ **Tex., San Antonio**—DWELLINGS—Olmos Lumber Co., c/o Jimmy Sholl, 2818 N. McCullough Ave., 33 dwellings, $373,315; 30 dwellings, $355,000; 25 dwellings, $410,000; 18 dwellings, $360,000; 20 dwellings, $395,700; 22 dwellings, $398,500; 17 dwellings, $345,500, in area Ridgeview Subdivision.

(Continued on page 165)

"I like the Adams for its economy of operation,"

says sub-contractor Roy Preston, of San Diego

Grader above is spreading sub-base material on a county road connecting Mt. Signal and Coyote Wells, Imperial County, California. Owner Preston is working for prime contractor N. L. Basich, of South San Gabriel. Contract calls for 22.6 mi. of grading and roadway-mix surfacing.

On this project, Roy Preston used his Adams 550 to pioneer haul roads, rip old asphaltic pavement, dig ditches, finish slopes, level sub-grade, and fine-grade before top surface was applied. Preston says, "I find there is substantial saving in fuel consumption with the Adams over other makes of motor graders, and maintenance and repairs are lower than any other I have used."

Adams does more work, in less time, at lowest cost

Let us prove it to you in actual demonstration! You can best see why this grader gets more work done when you watch the smoothness of a modern Adams at work. See how easily it picks up the load, how constant-mesh transmission shifts easily — with no clash of spur gears.

Eight forward speeds (1.4 to 25 mph) provide the necessary wide speed range to handle all operations at fastest practical rate with maximum power. Three additional "creeper speeds", optional (.23 to 1.82 mph), gear the grader down for accurate finishing in tight places, make it easy to penetrate rooty, rocky terrain, eliminate shock loads from machine. And 4 reverse speeds (1.8 to 13 mph) save time on shuttle-grading and mixing. *No other grader offers this wide range of speeds* which enables Adams to do *more* work in *less* time at *lower* cost.

Make a date!

Accept our invitation to see a modern Adams in operation. Contact your local LeTourneau-Westinghouse Distributor. He will be glad to take you on a field trip, let you see these graders at work, convince yourself.

A size ADAMS for every need

Model 660
— 150 hp Diesel Engine, 27,730 lbs.

Model 550
— 123 hp Diesel Engine, 23,500 lbs.

Model 440
— 104 hp Diesel Engine, 21,500 lbs.

Model 330
— 80 hp Diesel Engine, 20,500 lbs.

TraveLoader—A high-speed, heavy-duty, self-propelled, belt-type loader for picking up and loading materials into trucks from windrows or stockpiles.

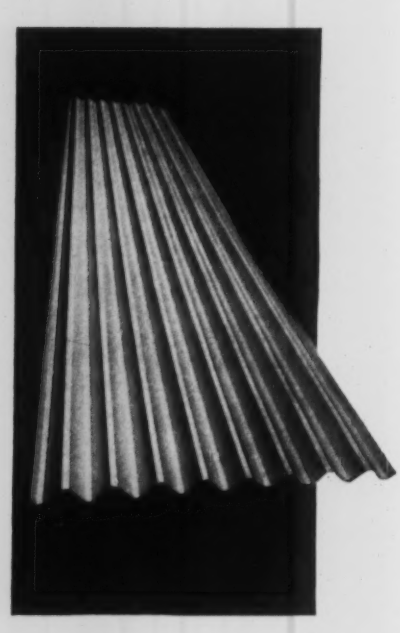
Leveling sub-grade in preparation for roadway-mix syrfacing, Adams 550 holds grade to close tolerance. With wide range of speeds, operator selects most practical speed for maximum power.
AG-24-G.bw

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

New, stronger Alcoa® Aluminum building sheet installs for only 65¢ a square foot

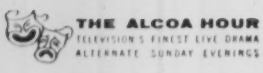


Substitute snow, ice or wind loads for the 1,687 pounds of man power in the picture and you have a good idea of the load-bearing capacity of new Alcoa Aluminum V-beam building sheet. Not only is Alcoa V-beam sheet strong, it's also long: individual sheets are 18 feet in length . . . nearly twice the length of any other aluminum V-beam sheet on the market today. This length and unusual strength pay off in lower building costs. Structural steel needs are cut as much as one-third; buildings go up faster. Now, walls and roofs for industrial buildings can be built of aluminum at an average cost of 65¢ a sq ft, exclusive of structural framing.

CUTS MAINTENANCE COSTS

Not only is the first cost exceptionally low, maintenance costs are practically eliminated. Alcoa V-beam does not require painting. You get aluminum's remarkable resistance to industrial dust, gases and sea air. You get its ability to reflect the sun's heat—keeping buildings as much as 15% cooler in summer, conserving fuel in winter.

When you are thinking ahead to new plant construction, investigate new 18-ft V-beam sheet. Call your nearest Alcoa sales office for names of approved applicators. Aluminum Company of America, 860-E Alcoa Building, Pittsburgh 19, Pennsylvania.



Your Guide to the Best in Aluminum Value

(Continued from page 162)

Tex., Silverton—CHURCH—First Baptist Church, Silverton, plans by Easterwood & Easterwood, 521 N. P. Anderson Bldg., Fort Worth, church. $500,000.

▲ Wash., Seattle—HOSPITAL—Northwest Memorial Hospital Assn., Jones Bldg., Zone 1, hospital, N 115 St. and Meridian Ave. $3,500,000. Work on first unit this year.

Wis., Rhinelander—GRADE SCHOOL—St. Joseph's Catholic Congregation, Rhinelander, plans by S. J. Stepnoski, 25 E. Merrill Ave., Fond du Lac, 1 story, 144x235 ft., concrete, wood grade school, $344,000.

▲ Wis., Ripon — DORMITORY, etc. — Ripon College, Ripon, plans by Holabird, Root & Burgee, 180 N. Wabash Ave., Chicago, Ill., men's dormitory, $1,000,000; plans by F. C. Shattuck Assocs., Inc., 174 E. North Water St., Neenah, women's dormitory, $500,000.

▲ Wyo., Casper—BANK—Casper National Bank, Casper, 8 story, 138,000 sq. ft., rein.-con. bank, $1,000,000. Robert Wehrli, 406 Wyoming National Bank Bldg., consult. engr. CD 3/8/54.

▲ Alta., Edmonton — OFFICE — Crosstown Investments Ltd., c/o 10520 107 St., plans by Bell & McCulloch, 9946 106 St., office Bldg. $1,000,000.

▲ Man., Winnipeg — COLLEGE — St. John's College, Broadway and Hargrave Sts., plans by Moody & Moore, 295 Broadway Ave., college expansion, incl. main college bldg., incl. classrooms, library, auditorium, chapel, offices, dining hall, 4 student residences, $1,025,000.

Ont., Hamilton — SERVICE CENTER, etc. — Canadian National Institute for the Blind, 186 Beverley St., Toronto, plains by Stanford & Wilson, 90 Eglinton Ave. E., Toronto, service centre and occupational shop for the blind, $500,000.

▲ Ont., Toronto—OFFICES—Jarbell Investments, 17 Fairleigh Cres., plans by E. I. Richmond, 455 Spadina Ave., 11 story, bsmnt., U-shaped, 17,200 sq. ft. apartment. $2,096,000. Farkas & Barrow, 7 Adelaide St. E., consult. engr. Previous plans for 3 office units on site have been changed. CD 9/28.

▲ Ont., Toronto—APARTMENT BLOCKS—Owner, c/o Oxford Realty Ltd., 352 Bloor St. E., 7 story, incl. 4,000 suites apartment blocks, midtown area, Wellesley, Bloor, Sherbourne, and Parliament Sts. Over $1,000,000.

▲ Ont., Toronto—RESIDENTIAL SHOPPING DEVELOPMENT, etc.—Principal Investments Ltd., 133 Richmond St. W., residential and shopping development on site of former Dufferin Racetrack, $10,000,000; B. D. Mathers, c/o owner, engrs.; 10 story office bldg., University Ave. south of Dundas St., $2,000,000.

▲ Ont., Toronto—OFFICE—Principal Investments Ltd., 133 Richmond St. W., 8 story office Bldg. with ground-floor arcade, $9,500,000. Work to start in 2 or 3 months. John Graham & Co., 1426 5 St., Seattle, Wash., U.S.A., archts. CD 1/25/55.

Ont., Toronto—CLUBHOUSE, etc.—Toronto Skating Club & Toronto Cricket Club, c/o 568 Dupont St., plans by Mathers & Haldenby, 15 St. Mary St., clubhouse, incl. skating rink, curling rink, $500,000. CD 2/20.

▲ Ont., Toronto—APARTMENTS—Weslake Holding Co., c/o A. E. LePage Ltd., realtor, 320 Bay St., two 25-suite apartments, first stage of 5-year program; continuing program will include extensive apartment construction. Total est. $5,000,000.

▲ Que., Montreal—TRADE and EXHIBITION CENTER—International Showrooms Ltd., 360 Craig St. W., 6 story, bsmnt., 33,000 sq. ft. permanent trade and exhibition center, $2,500,000.

▲ Que., Nicolet—CATHEDRAL—Corp. Episcopale R. C. of Diocese of Nicolet, cathedral. $2,500,000.

▲ Que., Nicolet—BISHOPRIC—Roman Catholic Diocese of Nicolet, Nicolet, new bishopric. $1,500,000.

▲ Que., Quebec City — OFFICE — Les Prevoyants du Canada, 56 St. Pierre St., plans by L. Mainguy, 1045 Chaumont St., office, Ste. Foye Rd., opp. St. Sacrament Hospital, $1,000,000.

INDUSTRIAL BUILDINGS

▲ Ala., Myrtlewood—MILL, etc.—Marathon Corp., Menasha, Wis., raw pulp and paper mill $30,000,000; converter plant, $20,000,000. J. E. Sirrine, 215 S. Main St., Greenville, S. C., consult. engr. on pulp and paper mill. CD 2/'10.

▲ Calif., Hesperia—PLANT—R. H. Osbrink Mfg. Co., 6917 McKinley Ave., Los Angeles, non-ferrous metal castings plant, $2,500,000.

▲ Calif., Lodi—PLANT, etc.—General Mills, Inc., 400 2nd Ave. S., Minneapolis 1, Minn. 76,130 sq. ft. cereal and cake mix plant addns., 47,000 sq. ft. warehousing, bulk storage bins, $1,250,000.

▲ Calif., Mojave—PLANT—California Portland Cement Co., 612 S. Flower St., Los Angeles, cement plant expansion. $10,000,000. Donald R. Warren Co., 3109 Wilshire Blvd., Los Angeles, consult. engr.

▲ Calif., Puente—PLANT—Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y., air-conditioning equipment plant. $6,000,000.

▲ Calif., San Diego—PLANT—Convair Div. General Dynamics Corp., 3165 Pacific Hy., plans by Perera & Luckman, archts. and consult. engrs., 9220 Sunset Blvd., Los Angeles, Zone 46, plant for research, development, mfg. and testing intercontinental missiles, near Sorrento Canyon, north of here. Total est. $40,000,000. Air Force will finance half cost, incl. equipment.

▲ Conn., Danbury—RESEARCH, etc.—Mosler Safe Co., 320 Fifth Ave., New York, N. Y., research and

HOW TO GET THE MOST FOR YOUR DOLLAR IN INDUSTRIAL BUILDING

EN-R's July 5, 1956 issue will include a special staff report on new trends in industrial plant design. Leading industrial plant designers have been cross-examined. A special EN-R editorial task force is pouring in a deluge of material from the field—facts and figures about power plants, warehouses, refineries, textile mills, chemical plants, auto plants, "hot" plants, where radio activity must be controlled. And it's being produced by the team that turned out last year's award-winning EN-R report on schools.

Here are some of the areas you'll find covered in the July 5 issue:

Do you need a new plant?
Where do you put it?
How do you plan it?
How do you keep costs down?
What's new in noise control?
How good is your temperature control?
What kind of lighting to use?
What's new in electrical distribution?

It all adds up to a gold mine of dollar-saving ideas for plant owners and consultants and contractors who work with them. And not to be overlooked is the fact that this issue of EN-R will be crammed with interesting and useful advertising from the firms who supply the equipment, materials and services that play a vital part in keeping the industrial building boom rolling.

Remember—for a wealth of specific information on how to get the most for your dollar in industrial building, see the special report in the July 5 Engineering News-Record.

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8" @ 17#	14" @ 38#
8" @ 28#	14" @ 43#
8" @ 35#	14" @ 53#
10" @ 15#	14" @ 58#
10" @ 21#	
10" @ 33#	Mill Lengths
12" @ 27#	and
12" @ 31#	Cut To Size

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3545 LINDELL BLVD., ST. LOUIS 3, MO.
Milwaukee and Twin Cities Denver New Orleans

development laboratory, production facilities and office, South St. $2,000,000.

▲ **Fla., Pensacola**—PLANT—NRC Metals Corp. (sub. National Research Corp.), 70 Memorial Dr., Cambridge 42, Mass., plant to produce reactor grade zirconium, near here. Contract signed with AEC.

▲ **Ill., Aurora**—PLANT—Caterpillar Tractor Co., 600 W. Washington St., East Peoria, plans by H. K. Ferguson Co., archt.-engr., 1783 E. 11 St., Cleveland, O., mfg. plant, $10,000,000. CD 5/1.

▲ **Ill., Decatur**—PLANT—Caterpillar Tractor Co., 600 W. Washington St., East Peoria, plant addns. $1,000,000.

Ill., Peoria—FACTORY—Hyster Co., 2902 N.E. Clackamas St., Portland 8, Ore., 25,000 sq. ft. brick, steel, concrete factory addn. $100,000. Start work in June.

Ind., Indianapolis—WAREHOUSE, etc.—General Electric Co., River Rd., Schenectady, N. Y., plans by Allen & Kelley, 333 N. Penn St., 200x400 ft. warehouse and office. $800,000. CD 4/4.

Ind., Salem—FACTORY—Wilson Poultry Processing Co., Orville Wilson, 509 W. 21 St., Anderson, 100x180 ft. concrete block FACTORY, Joseph St. at south edge of city, $150,000.

▲ **Kan., McPherson**—ALKYLATION UNIT—National Cooperative Refinery Assn., McPherson, alkylation unit, 1,560 bbl. capacity, $3,500,000, Refinery Engineering Co., Wright Bldg., Tulsa, Okla., consult. engrs.

Minn., Pelican Rapids—PLANT—West Central Turkeys, Inc., Pelican Rapids, turkey processing plant, $300,000.

▲ **N. J., Berkely Heights**—LABORATORY, etc.—Bell Laboratory, 463 West St., New York, N. Y., 4 story laboratory and warehouse, (Murray Hill Section), $1,500,000.

N. J., Neptune—PLANT—Telrex Laboratories, Rutherford Ave., plans by Edward M. Annitto, 715 Mattison Ave., Asbury Park, industrial plant, $150,000.

▲ **N. J., Palisades Park**—WAREHOUSE, etc.—S. A. Schonbrunn Co., Inc., 77 Water St., New York, N. Y., plans by William Higginson & Son, 101 Park Ave., New York, N. Y., 100,000 sq. ft. warehouse and office, for roasting and packaging coffee. Over $2,000,000.

▲ **N. Y., New York**—GARAGE—50 West 44 St. Corp., 100 E. 42 St., Zone 17, plans by Kahn & Jacobs, 2 Park Ave., Zone 16, 3 addnl. floors to 8 story garage and store at 1120-36 Sixth Ave. and 53 W. 43 St. $1,600,000.

N. D., Langdon—WAREHOUSE, etc.—United Telephone Mutual Aid Corp., Langdon, plans by Grosz & Anderson, 314½ DeMers Ave., Grand Forks, warehouse, shop, service bldg. $100,000.

O., Cincinnati—PLANT—Witt-Cornice Co., Winchell Ave., plans by A. M. Kinney, Inc., archt.-consult. engr. 2905 Vernon Pl., 1 story, 70,000 sq. ft. brick, structural steel plant. $800,000.

▲ **O., Dayton**—FACTORY—McCall Corp., Marvin Pierce, pres., 221 McCall St., 140,000 sq. ft. factory addn. $1,250,000. CD 3/11/53.

▲ **O., Lorain**—COKE OVENS—National Tube Div., U. S. Steel Corp., E. 28 St. and Pearl Ave., battery of 59 coke ovens, incl. addnl. equip. for coal handling and chemical recovery. $5,000,000-$7,000,000.

R. I., North Smithfield—PLANT—Greater Woonsocket Industrial Development, c/o Fontaine & Bohl, archts., 223 Thayer St., Providence, 40,000 sq. ft. brick, steel frame industrial plant. $500,000.

Tex., Corpus Christi—WAREHOUSING—Midcap Bearing Service Co., 13 Mesquite St., warehousing. $125,000.

▲ **Tex., Ennis**—PLANT—W. E. Grace Mfg. Co., 6000 S. Lamar St., Dallas, plant to mfr. road machinery, 30-acres site Hy. 75. Approx $1,000,000.

Tex., Houston—PLANT—Forsyth Engineering Co., 875 Lockwood St., plant expansion. $200,000.

Tex., Houston—AUTO AGENCY—Moore-Turner Chevrolet Co., 5300 Jensen Dr., auto agency. $350,000.

Tex., Houston—WAREHOUSE—Pulaski Iron & Metal Co., 6000 Esperson St., plans by David & Edw. Brooks, 1901 Whitney St., 14,000 sq. ft. rigid frame, masonry warehouse, $200,000. Ernest L. Vogt, Jr., 707 Hawthorne St., consult. engr.

Tex., Houston—INDUSTRIAL—Radal Southern Corp. (Real Estate Div. of General Motors), 4708 Wake Forrest St., industrial bldg. $100,000.

Tex., McAllen—WAREHOUSE—Sweeney & Co., Inc., 2330 Roosevelt St., San Antonio, warehouse, 15-acre site. $400,000.

Tex., Pasadena—AUTO AGENCY—Boyd Mullen Chevrolet Co., 616 W. Sterling St., Houston, auto agency (shop, display, storage, parts, etc.), at Ritchie and Sterling Sts. $200,000.

Tex., Rockwall—AUTO AGENCY—Rockwall Ford Agency, Rockwall, auto agency. $100,000.

▲ **Man., Winnipeg**—FACTORY, etc.—Dominion Envelopes & Cartons (Western) Ltd., c/o 111 Richmond St., W., Toronto, Ont., 300x600 ft., factory and warehouse, 13½-acre site. $1,500,000.

Ont., Brantford—PLANT—Massey-Harris-Ferguson Ltd., 915 King St. W., Toronto, plans by J. G. Elliott, ch. archt., c/o owner, large plant expansion progarm, 118-acre on Park Rd. Over $250,000.

Ont., Ottawa—PARKING GARAGE—By Ward Investments Ltd., 43 George St., 4-level, 330-car parking garage, George and York Sts. $500,000.

Ont., Ottawa—PARKING GARAGE—Whittington Investments Ltd., 140 Wellington St., 6 story, 600-car mechanical parking garage, Queen-Albert Sts. corner Metcalfe St. $900,000.

▲ **Que., Baie Comeau**—ALUMINUM SMELTER—Canadian British Aluminum Co. Ltd., 1980 Sherbrooke St. W., Montreal, two-stage aluminum smelter, first stage est. $72,000,000. Bids in a month. Second stage 1961 and 1965. C. D. Howe Co. Ltd., 1421 Atwater Ave., Montreal, consult. engrs. CD 1/6.

Que., L'Etang Du Nord—PLANT—Owner, c/o Dpt. Fisheries, Quebec City, freezing fish fillets plant. $200,000.

▲ **Que., Montreal**—PLANT—Canadian Bridge Co. Ltd., 1219 Walker Rd., Walkerville, Ont., plans by Percy Booth, 4795 St. Catherine St. W., plant. $1,000,000. T. Pringle & Sons, Ltd., 4795 St. Catherine St. W., consult. engrs. CD 2/7.

▲ **Que., Montreal**—PLANT—Gattuso Corp., 5205 Cote de Liesse Rd., plans by Patsy Colangelo, 8259 St. Lawrence Blvd., rear of present plant extension, $2,000,000.

▲ **Que., St. Felicien**—PLANT—Saquenay Neutral Sulphate Co., St. Felicien, Que., plant near Laberge Freres. $2,000,000.

▲ **Que., St. Johns**—PLANT—Cables, Conduits & Fittings Ltd., 77 Rochelieu St., plans by Meadowcroft & McKay, 4115 Sherbrooke St. W., Montreal, plant extension to house copper and rolling mill at plant site, St. Louis St. $2,000,000.

▲ **Que., Shelter Bay**—SMELTER—Cartier Mining Co., subsidiary of U. S. Steel Corp., Royal Bank Bldg., Toronto, Ont., iron ore smelter, railroad and docks. $15,000,000.

UNCLASSIFIED

▲ **Arkansas**—RURAL DISTRIBUTION LINES—Southwest Arkansas Electric Co-operative, 707 E. Broad St., Texarkana, Zone 12, 19 mi. 34.5 kv transmission line, 69 mi. electrical distr. line, two 2000 kva sub-stations, Bradley and McKamie and sys. imprvs., Miller Co. $1,435,000. CD 3/18/49.

Conn., Hartford—SITE IMPRVS.—Town, Town Hall, imprv. site of Regional Technical School near Flatbush Ave. $130,000. Winfred W. DeMay, city engr.

▲ **Ill., Chicago**—MAUSOLEUM—Oak Woods Cemetery, 1035 E. 67 St., plans by Harley Ellington & Day, Inc., archt.-engr., 153 E. Elizabeth St., Detroit, Mich. mausoleum, $5,000,000.

▲ **Mich., Detroit**—RECREATION FIELDS—City, Parks & Recreation Comn., 1214 Griswold St., Meharas Recreation Field, incl. recreation bldg., gymnasium, swimming pool, Algonquin St., $750,000; Kemeny Recreation Center, incl. indoor-swimming pool, gymnasium, club rooms, facilities, 20 acres, Fort and Purdue Sts., $300,000; O'Shea Playfield, incl. community center, swimming pool, etc., Greenfield and Fullerton Sts., $300,000, Milton F. Wagnitz, city engr.

Minn., Jordan—RURAL DISTRIBUTION LINES—Minnesota Valley Electric Co-operative, Jordan, 80 mi. rural distr. lines Scott Co., $100,000. CD 6/8/50.

Missouri—SYSTEM IMPRVS.—Pemiscot-Dunklin Electric Co-operative, Hayti, constr. sys. extens., imprvs., Pemiscot Co. $227,000.

† **Montana**—BUILDINGS, UTILITIES—National Park Service, Dpt. Interior, 19 and C Sts. N. W., Wash., D. C., bldgs. and utilities, $225,000; road imprv., $122,000, Custer Battlefield National Monument.

▲ **Nebraska and South Dakota**—RURAL DISTRIBUTION LINES—Loup River Public Power Dist., Columbus, transmission lines, Broken Bow to North Platte, Neb. $732,000; sub-station, Neligh, Neb. $87,000; sub-station, Creighton, Neb., $354,820; transmission line from Creighton, Neb. to Gavins Point, S. D., $540,000. P. E. Hampton, c/o owner, ch. engr.

N. J., Newark—SKATING RINKS—Essex Co. Park Comn., Court House, Newark, indoor skating rink South Mountain Reservation, West Orange, $750,000; plans by John H. & Wm. C. Ely, 744 Broad St., Newark, indoor skating rink, Branch Brook Park, Newark, $250,000.

Oklahoma—GAS LINE—Phillips Petroleum Co., Bartlesville 17 mi. 3 in. gas line from West Bradley gasoline plant. $100,000. H. A. Shelden, c/o owner, engr.

Tenn., Franklin—GAS SYS.—City, City Hall, natural gas sys. $500,000. Polk, Powell & Hendon, Stallings Bldg., Birmingham, Ala., consult. engrs.

Texas—TELEPHONE SYS. IMPRVS.—Romain Telephone Co., Plains, rural telephone sys. imprvs., incl. pole lines, Plains, Yoakum Co. $217,000. Cecil Hawk & Assocs., 1629 Broadway, Lubbock, consult. engrs.

Tex., Corpus Christi—LIGHTING—Edwin Flato Co., 2022 Laredo St., area lighting, $75,000; gas lines, $77,000, in "Tropic Isles".

Tex., Dallas—SWIMMING POOL—Riverlake Country Club, Meadows Bldg., rein.-con. outdoor swimming pool, Olympic type. $110,000.

Tex., Irving—PARK, etc.—City, City Hall, voted bonds Apr. 24, park, $100,000; swimming pool, $100,000. CD 4/17.

Tex., Lubbock—PARK—Lubbock County Water Control & Imprvt. Dist. No. 1, Lubbock, voted bonds Apr. 17, park, $760,000.

Tex., Robert Lee—PARKS—Coke Co., Court House, voted bonds Apr. 7, parks, incl. swimming pools, facilities, $130,000. CD 3/30.

Tex., San Antonio—GOLF COURSES—Harold Olsen, Pleasanton Rd., 18 hole golf course, 500-acre plot off Hy. 281, south. $110,000.

Wisconsin—RURAL DISTRIBUTION LINES, etc.—Adams-Marquette Electric Co-operative, Friendship, 60 mi. rural distr. lines, 5.5 mi. 34.5 kv transmission line, addnl. sub-station facilities, sys. imprvs., Adams Co. $418,000.

Que., Arvida—CURLING RINK—Arvida Curling Club, Arvida, curling rink, $100,000.

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saves construction time

Rosepoint Multiple Span Bridge west of Butler, Pa.

Designed by Bridge Department, Pennsylvania Division of Highways.

Osborne Construction Company, Franklin, Pa., Contractors.

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Reinforced concrete has many other advantages as well. No other method of construction is so flexible. No other construction medium permits so infinite a variety of imaginative and beautiful designs.

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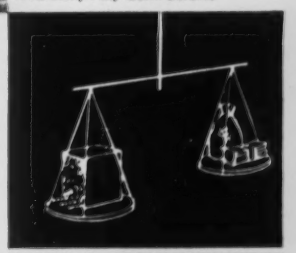

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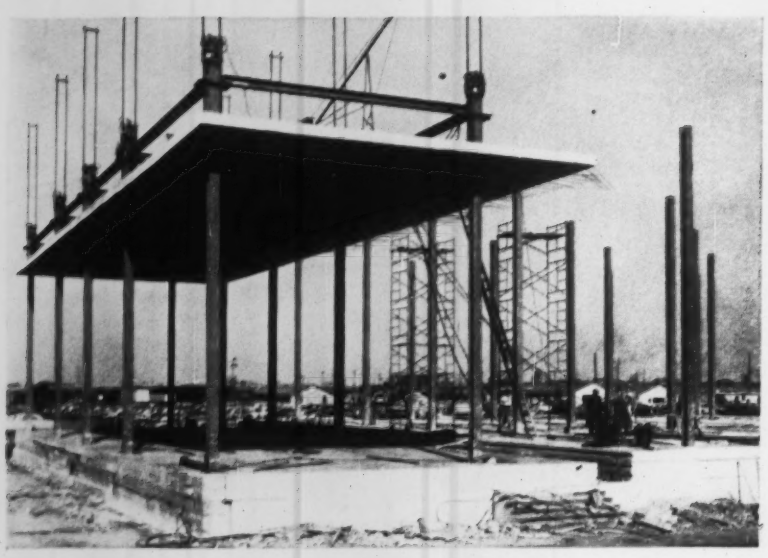

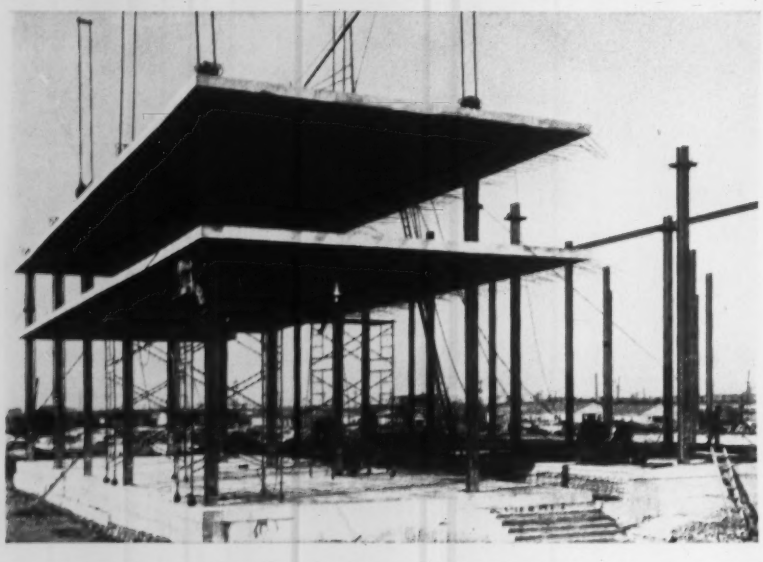

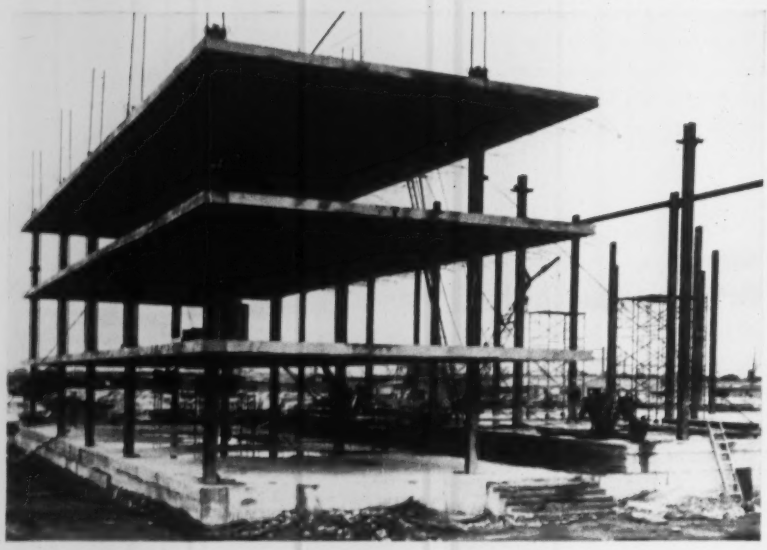

Goes up 20% faster this way

To erect a new 370,000 sq. ft. office building for the manufacturing divisions at Ford Motor Company's Rouge plant, in Dearborn, Mich., Long Construction Company of Kansas City used the lift slab method shown here.

The double "T" shaped building was divided into 28 "lift sections". Reinforced concrete slabs for the roof and floors of each lift section were then poured in one form at ground level. A sprayed-on resinous film kept the slabs separated and steel collars were embedded in their concrete around the supporting columns.

When hardened, the 400-ton slabs were raised in sequence, at about 4' per hour, by hydraulic jacks atop the columns. Welding the embedded steel collars to the columns then fixed each of the slabs in place.

The builders estimate more than 20% saving in construction time by this method. One great advantage is the economy of pouring all slabs at ground level, using mobile truck mixers of certified design, capacity, mixing speed and accuracy of water control.

You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

BLAW-KNOX CONSTRUCTION EQUIPMENT DIV.
Mattoon, Ill.

CHAIN BELT COMPANY
Milwaukee, Wis. and Los Angeles, Calif.

CHALLENGE MANUFACTURING CO.
Los Angeles, Calif.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

THE JAEGER MACHINE COMPANY
Columbus, Ohio

THE T. L. SMITH COMPANY
Milwaukee, Wis.

WILLARD CONCRETE MACHINERY CO., LTD.
Lynwood, Calif.

WORTHINGTON CORPORATION
Plainfield, N. J.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 21 Connecticut May 23 Maine
STREETS AND ROADS
May 22 Massachusetts

BUILDINGS—LB & CA

▲ **The House That Techbuilt,** 55 Brattle St., Cambridge, Mass. Owner Builds. $1,000,000. RESIDENTIAL DEVELOPMENT, 30 houses, Middle Ridge near Rtes. 3 and 128, LEXINGTON, MASS. Karl Koch Architects & Assoc., 55 Brattle St., Cambridge, Mass., archts.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 7 New York
STREETS AND ROADS
May 29 New Jersey June 7 New York

BUILDINGS—BA

▲ **Del., Wilmington**—SCHOOL—BA 5/23—Whiteside, Moeckel Carbnell, archts., 909 Tatnall St., Junior High School, Shipley Rd., for Alfred I. DuPont Special School Dist., 3606 Concord Pike, Wilmington, Del. $2,000,000. CD 1/25.

▲ **Pa., Phila.**—OFFICE—BA 6/6—General State Auth., 18 and Herr Sts., Harrisburg, state office bldg.; Broad and Spring Garden Sts. $8,000,000. Plans deposit $100. Extended date. Collaborating Architects (Carroll, Grisdale and Van Alen, Harbeson, Hough, Livingston and Larson, and Nolen and Swinburne), 1621 Chestnut St., Zone 3, archts. (Correction-architects). CD 4/25.

▲† **Pa., Tobyhanna**—BARRACKS—BA 6/12—U. S. Eng., 2635 Abbottsford Rd., Phila., 2 barracks bldgs. site imprvs., Signal Depot, ENG-36-109-56-64.- $1,000,000. Rinker & Kiefer, Stroudsburg, engrs.-archts. CD 2/9/51.

BUILDINGS—SLC

▲ **Pa., Harrisburg**—SHOPPING CENTER— Rosengarten & Kraemer, engrs.-archts., 10 S. 18 St., Phila., soon lets contract 1 and 2 story, brick concrete block, shopping center, incl. 20 stores, parking area for Harrisburg Shopping Center, Inc., c/o Alan Corson, 1231 Vine St., Phila., Pa. $2,500,000.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State P. Wks. Dpt., John W. Johnson, supt., The Gov. Alfred E. Smith State Office Bldg., Albany.

N. Y.—**Cold Spring Construction Company,** 3 Jackson St., Akron, N. Y., LB $723,203, est. $818,000. (3 bidders) reconstr. 3.53 mi. sect. of Rte. 19 passing through the village of Fillmore, Allegany Co.

N. Y.—**Greater New York Wrecking Corporation,** New York, N. Y., LB $110,743, est. $170,000. (9 bidders) Arthur V. Sheridan Expressway, contract provides for demolition of buildings from Bruckner Blvd. to E. 174 St., distance 0.93 mi., Bronx Co.

N. Y.—**H. L. Baughman, Inc.,** 1240 Jefferson Rd., Rochester 18, N. Y. LB $898,645, est. $985,000. (7 bidders) reconstr. 6.55 mi. Rte. 38 from Tompkins Co. line northerly to Moravia, Cayuga Co.

N. Y.—**Serafini Construction Co., Inc.,** RD 1, Conklin Rd., P. O. Box 265, Binghamton, N. Y., LB $1,123,886, est. $1,146,000. (2 bidders) reconstr. 7.24 mi. Rte. 34 from Auburn City line to Weedsport, Cayuga Co.

N. Y.—**City Construction Company,** 640 Jay St., Utica, N. Y. LB $963,042, est. $1,140,000 (6 bidders) reconstr. relocation 7.88 mi. Rte. 12 starting near Chenango-Madison Co. line and exten. northeasterly in three sections toward Waterville, Chenango Co.

N. Y.—**Hogeboom & Campfield, Inc.,** Seneca Turnpike, Box 535, New Hartford, N. Y. LB $1,167,041, est. $1,365,000 (5 bidders) reconstr. 4.5 mi. sect. of Rte. 12B between Sherburne and Earlville, Chenango Co.

N. Y.—**Vernon Christiana, Jr.,** Box 413 Utica, N. Y., LB $986,047, est. $1,318,000. (6 bidders) reconstr. 8.69 mi. sect. of Rte. 3 from Moffitsville through Cadyville, Clinton Co.

N. Y.—**Peckham Road Corporation,** 50 Haarlem Ave., White Plains, N. Y., LB $562,034, est. $605,000. (2 bidders) 4.19 mi. sect. of Rte. 66, Chatham to Chatham Center to Rider Mills, Columbia Co.

N. Y.—**Holmes & Murphy, Inc.,** Bank St., Orchard Park, N. Y., LB $158,859, est. $159,000. (1 bidder) constr. 0.34 mi. of Seymour St. from Main St. to Niagara St. in city of Tonawanda, Erie Co.

N. Y.—**C. P. Ward, Inc.,** 700 Hollenbeck St., Rochester, N. Y. LB $453,542, est. $467,000 (1 bidder) constr. 2.11 mi. portion of Oak St. arterial route in Batavia from Main St. to North city line, Genesee Co.

N. Y.—**Collins Brothers, Inc.,** 12 Tallmadge Pl., Mechanicville, LB $661,608, est. $711,000 (3 bidders) reconstr. relocation of 3.49 mi. Rte. 30 starting in Wells and exten. northeastward to Rte. 8 intersection, Hamilton Co.

N. Y.—**Hogeboom & Campfield, Inc.,** Seneca Turnpike, Box 535, New Hartford, N. Y., LB $390,642, est. $421,000. (3 bidders) reconstr. 3.38 mi. Rte. 5-S between Mohawk and Fort Plain, Herkimer Co.

N. Y.—**Louis Longhi & Son, Inc.,** P. O. Box 580, Glens Falls, N. Y. LB $198,716, est. $212,000. (3 bidders) reconstr. 1.51 mi. Rte. 51 town of Cedarville and town of Winfield between Rte. 55 and Rte. 20, Herkimer Co.

N. Y.—**Madison County Construction Co., Inc.,** Box 14, Madison, N. Y., LB $1,461,230, est. $1,642,000. (3 bidders) reconstr. 5.72 mi. Fonda to Fort Johnson sect. of Rte. 5, Montgomery Co.

N. Y.—**Walter P. Blimm Company, Inc.,** 270 State Rd., Lockport, N. Y., LB $179,609, est. $183,000. (1 bidder) constr. 0.42 mi. sect. Walnut St. arterial route in Lockport from Washburn St. to Pound St., Niagara Co.

N. Y.—**John Arborio, Inc.,** West Cedar St., Poughkeepsie, LB $649,496, est. $697,000 (2 bidders) reconstr. 3.13 mi. Rtes. 97 and 42 northwesterly from Port Jervis, Orange Co.

N. Y.—**Hogeboom & Campfield, Inc.,** Seneca Turnpike, Box 535, New Hartford, N. Y., LB $307,339, est. $332,000. (3 bidders) constr. 3.58 mi. existing county road between Brewerton and Rte. 11 northeasterly to Phillips Corners on Rte. 49, Oswego Co.

N. Y.—**Louis Mayersohn, Inc.,** 36 State St., Albany, LB, $751,665, est. $906,000. (11 bidders reconstr. relocation 10.2 mi. Rte. 13 starting in Pulaski and exten. southeastward to Albion-Williamstown town line, Oswego Co.

N. Y.—**Green Island Construction Company,** 594 Broadway, Watervliet, N. Y., LB $416,955. Est. $531,000. (5 bidders) paving 6.54 mi. sect. of Rte. 20, two lanes of Cherry Valley By-Pass, Otsego Co.

N. Y. **John Arborio, Inc.,** West Cedar St., Poughkeepsie, N. Y. LB $2,468,318. Est. $1,966,000. (14 bidders) paving 5.77 mi. Palisades Interstate Parkway between Rte. 59 and Rte. 45, Rockland Co.

N. Y. **John Arborio, Inc.,** West Cedar St., Poughkeepsie, N. Y., LB $827,051. Est. $965,000. (5 bidders) paving 2.8 mi. Palisades Interstate Parkway from New York-New Jersey State Line to Rte. 303, Rockland Co.

N. Y.—**Warren Brothers Roads Co.,** Syracuse, N. Y., LB $174,554. Est. $175,000. (1 bidder) constr. 1.78 mi. existing county road between towns of Ovid and Romulus, Rte. 96 and southeasterly to Rte. 89, Seneca Co.

N. Y.—**Warren Brothers Roads Company,** Syracuse, N. Y. LB $365,810. Est. $398,000. (3 bidders) reconstr. 3.98 mi. starting outside Interlaken and exten. in a southerly direction towards Trumansburg on Rte. 96, Seneca Co.

N. Y.— **Serafini Construction Co., Inc.,** RD #1, Conklin Rd., P.O. Box 265, Binghamton, N. Y. LB $632,467. Est. $635,000. (1 bidder) reconstr. 1.54 mi. Main St. in Village of Waterloo portion of Rtes. 5 and 20, Seneca Co.

N. Y.—**Amsterdam Excavating Co., Inc.,** Amsterdam, N. Y., LB $372,351. Est. $455,000. (4 bidders) reconstr. 4.19 mi. Rte. 209 starting at Sullivan Co. line and exten. northerly to Ellenville, Ulster Co.

N. Y.—No bids received 5/10/55, Est. $8,375,000. constr. 2.84 mi. Cross-Bronx Expressway between Fulton and Longfellow Aves., Bronx Co.

N. Y.—No bids received 5/10, Est. $306,000. reconstr. 0.48 mi. sect. of Rte. 28 in village of Margaretville, Delaware Co. Bids Apr. 10. CD 4/4.

▲† **D. W. Winkelman Co., Inc.,** 205 Harrison St., Syracuse, N. Y. LB $2,958,529, est. $2,890,356. relocating parts of Roosevelt Hy. and New York Central R.R. from Raquette River to point north of Grass River St. Lawrence Seaway, St. Lawrence River, single track railroad about 2.3 mi. long, 22 ft. wide, bit. concrete paved hy. with 10 ft. shoulders from South Grass River Rd. constr. of Grass River Bridge, 1,117 ft. long consisting of 8 deck plate girder spans, approx. 140 ft. long, supported on 7 piers and 2 abutments, timber deck will carry railroad in center of 22 ft. hy. with 3 ft. sidewalk on one side and 1 ft. curb on other, work located near International Rapids Sect. of St. Lawrence River, 7 mi. northeast of Massena, for St. Lawrence Seaway Development Corp., CIVENG-30-023-56-28, NEW YORK. U. S. Eng., Engineer Park, Niagara and Bridge Sts., Buffalo 7, N. Y. Bids May 8. CD 4/24.

▲ **LaFera Constr Co., Inc.,** 149 Verona Ave., Newark, N. J. LB $2,281,719. (2 bidders) design and construct third section of sewerage sys., Hillcrest-Totowa Section, PATERSON, N. J. City, City Hall, Paterson, N. J. Bids May 8. CD 4/19.

PENNSYLVANIA—State Hy. Dpt., 506 N. Office Bldg., Harrisburg.

Allegheny Contg. Industries, Inc., 801 Bingham St., Pittsburgh 3, Pa. CA $919,554. constr. 28,761 ft. crushed aggregate base with bit. surf. 22 ft. wide, 5-rein.-con. arches, Girard and Covington Twps., L.R. 17052 (3), Clearfield Co. Bids Apr. 20, awarded May 7. CD 5/4, under LB.

† **Baltimore Contractors, Inc.,** 711 S. Central Ave., Baltimore 2, Md. LB $969,000. (11 bidders) concrete, steel, masonry buildings, Air National Guard at Glenn L. Martin Airport, MIDDLE RIVER, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. Bids Apr. 24. CD 4/20.

BUILDINGS—LB & CA

▲† **Malan Constr. Corp.,** 2 Park Ave., New York 16, N. Y. LB $5,141,879. MEDICAL RESEARCH CENTER, at Brookhaven National Laboratory, incl. 1 story, 58,000 sq. ft. research laboratory, 1 story, 45,000 sq. ft. research hospital, 7,000 sq. ft. industrial medicine and X-ray, 1 story, 8,000 sq. ft. central facilities, reactor bldg., exten. of distr. sys. for power, water, heat, sewerage, necessary site work, etc., BROOKHAVEN, N. Y. Atomic Energy Comm., 1901 Constitution Ave. N.W., Wash., D. C. Bids May 8. CD 5/3.

▲ **Goldin Builders, Inc.,** Archie Golden, 506 Elizabeth Ave., Linden, N. J., Owner Builds, $4,500,000. 200 HOMES known as "Berkley Gardens", Park and Mountain Aves., BERKELEY HEIGHTS, N. J. Harry Maslow, 275 Morris Ave., Elizabeth, N. J., archt.

▲ **Gottlieb Schneider,** 1446 Moncocacy St., Bethlehem, Pa. CA $2,771,663. 1, 2, 3 story, stone, brick, concrete 11,175 sq. ft. Louis E. Dieruff Junior High SCHOOL, swimming pool, parking area, ALLENTOWN, PA. Allentown School Dist., 31 S. Penn St., Allentown, Pa. CD 4/13, under LB.

▲ **Joseph R. Farrell,** 4424 Market St., Phila., Pa. CA $2,196,966. 1 and 1½ story, brick 140,000 sq. ft. SENIOR HIGH SCHOOL, Old Gulph Rd., ROSEMONT, ARDMORE, PA. Lower Merion Twp. School Dist., Ardmore, Pa. Bids Apr. 25. CD 4/5.

▲ **Dominic Maurer,** Shillington, Pa. LB $1,443,976. general contract, 1 and 2 story, bsmnt., brick, 145,750 sq. ft. Roberts Junior and Senior HIGH SCHOOL, sewage disposal system, BUCKTOWN, PA. Northern Chester Co. Joint School Auth., Parkerford, Pa. Bids Apr. 25. CD 4/6.

▲ **McCloskey & Co.,** 1620 W. Thompson St., Phila., Pa. CA $3,117,000. general constr. 1 story, bsmnt., 91x280 ft., 147x213 ft., 114x150 ft., brick, concrete block, steel Girls' High SCHOOL, Broad St. and Olney Ave., PHILA., PA. Phila. Bd. Educ., 21 and Winter Sts., Phila., Pa. Bids Apr. 27. CD 3/8.

▲ **Schiefer Constr. Co.,** Newtown Square, Pa. Separate Contracts. $1,000,000. RESIDENTIAL DEVELOPMENT, 70 units, Township Line, PLYMOUTH MEETING, PA.

▲ **Burkey Constr. Co.,** 1800 Hampden Blvd., Reading, Pa. CA $1,000,000. 1 story, 80,000 sq. ft. masonry, steel SHOPPING CENTER with parking facilities, READING, PA. Food Fair Properties, Inc., 99 Park Ave., New York, N. Y. Bids Apr. 4. CD 3/28.

▲ **Sidney Elkman,** 17 and Thompson Sts., Phila., Pa. CA $1,000,000. 2 story, stone, brick, 100,000 sq. ft. DEPARTMENT STORE, SPRINGFIELD, PA. Owner, c/o Morris A. Kravitz, Inc., 225 S. 15 St., Phila., Pa. George W. Neff, 152 Locust St., Phila., Pa., archt.

▲ **Wark & Co.,** 1920 Sansom St., Phila., Pa. CA $1,978,600 general constr. JUNIOR HIGH SCHOOL, UPPER DARBY, PA. Upper Darby Twp. School Auth., Lansdowne Ave. and School Lane, Upper Darby, Pa. CD 4/23, under LB.

▲ **National Capitol Housing Auth.,** 1729 New York Ave., N. W., Wash., D. C., rejected bids Apr. 26, Arthur Capper DWELLINGS, D. C. 1-20, incl. 612 dwelling units, 2 and 7 Sts., Virginia Ave. and M Sts. S. E., WASH., D. C. LB $7,188,000. Will readvertise. CD 4/30, under LB.

▲ **Standard Constr. Co.,** 1010 Vermont St. N. W., Wash., D. C., CA. $2,000,000, 13 story, concrete, brick, stone OFFICE, 1000 Connecticut Ave. WASH., D. C. C. Kaplan & A. Bennett, 1010 Vermont Ave. N. W. Wash., D. C. Corning & Moore, 1302 18 St. N. W., Wash., D. C., archts.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 23 Louisiana May 24 Florida
May 25 Kentucky
STREETS AND ROADS
May 22 West Virginia May 24 Florida
May 25 Kentucky

HEAVY CONSTRUCTION—LB & CA

▲ **J. H. Pritchard Constr. Co.,** 2261 W. Holcombe St., Houston, Tex. CA $2,070,000. 4 compressor stations, Clementsville, Ky., Hampshire, Tenn., Water Valley, Miss., and Delhi, La., KENTUCKY-TENNESSEE—MISSISSIPPI-LOUISIANA. Gulf Interstate Gas Co., 1125 Brazos St., Houston, Tex. Awarded May 3. CD 11/16/50.

▲ **Holden Constr. Co.,** P.O. Box 471, Mount Vernon, Ill. CA Approx. $1,000,000 natural gas lines 260,000 2- to 6-in.; 79,800 ft. 0 in. wrapped steel pipe, 924 services, Graves and Calloway Counties, MURRAY, KY. City, Murray, Ky. Bids Apr. 2, awarded Apr. 10. CD 3/21.

BUILDINGS—LB & CA

▲ **Eugene Simpson & Brother,** 300 Montgomery St., Alexandria, Va., LB $1,125,290 (7 bidders) Bradlee SHOPPING CENTER, Rte. 7 and Quaker Lane, ALEXANDRIA, VA. Tower Constr. Co., 1726 "L" St. N.W., Wash., D. C. Bids May 8. CD 4/17.

Sullivan Constr. Co., 1047 Atlantic Blvd., Pompano Beach, Fla., LB $960,000. APARTMENT, Atlantic Blvd., DEERFIELD BEACH, FLA. Cove Realty Co., c/o Robert E. Hanson, 311 S.E. 16 Ave., Ft. Lauderdale, Fla. CD 3/14.

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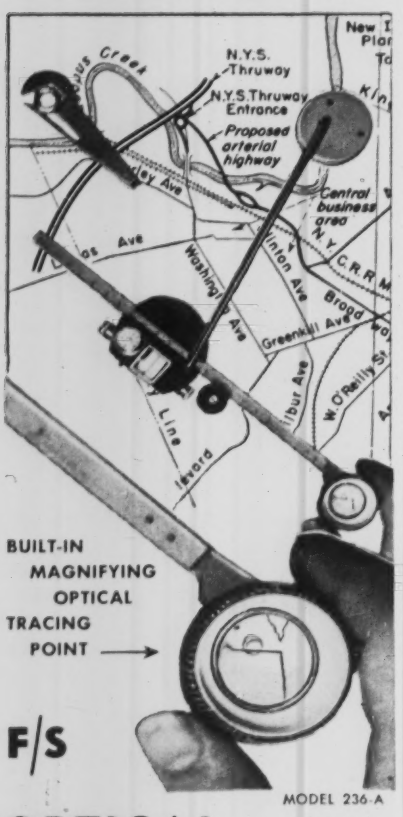

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MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 22 Wisconsin — May 23 Michigan
STREETS AND ROADS
May 22 Wisconsin — May 23 Michigan

BUILDINGS—BA

▲ Mich., Flint—SCHOOL—BA 5/22—Bd. Educ., Kearsley Rural School Dist. No. 14, Ray Ross, Genesee and Richfield Rds., high school North Genesee and Crosby Sts., Kearsley. $1,000,000. Plans deposit $40, refundable. MacKenzie, Knuth & Klein, Inc., 700 Harrison St., Flint, archt. C. L. Toonder & Assoc., 19526 W. McNichols Rd., Detroit, engrs. CD 3/30, under LB.

▲ Mich., Marquette—PHYSICAL EDUCATION—BA 5/24—State, A. N. Langius, dir. State Bldg. Lewis Cass Bldg., Lansing, rein. con., steel masonry physical education bldg., Northern Michigan College of Education. $1,200,000. Plans deposit $40, Warren S. Holmes Co., 2200 Michigan National Tower, Lansing, archt. Bids Mar. 22 rejected. CD 4/17, under LB.

HEAVY CONSTRUCTION—LB & CA

▲ **Fishel Co.**, 1170 Kinnear Rd., Columbus, O. LB $1,318,468, est. $1,571,154, service mains from new WW to the city, SPRINGFIELD, O. City, Springfield, O. Black & Veatch, 4706 Broadway, Kansas City, Mo. Bids May 4.

▲ **Michael J. McDermott & Co.**, 30 N. La Salle St., Chicago, Ill., CA, $1,612,679, railroad underpass, Ashland Ave., 49 St., Chicago Junction R. R. r/w, CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids Apr. 16. CD 4/25; under LB.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**William J. Muehlenbeck**, 1253 S. Water St., Saginaw, Mich. CA $575,758, est. $600,000. c. conc. 11.373 mi. on relocation of US-23, BM 25-35 C2-RO, BM 25-53 C3-RO, etc., Genesee Co.;

Mich.—**Pierson Contg. Co.**, 200 Eddy Bldg., Saginaw, Mich. and **Louis Garavaglia**, 24240 Mound Rd., Center Line, Mich. CA $1,187,252, est. $1,200,000 c. conc. 5.546 mi. relocation of M-60, F 11-73 C3-R, F 14-13 C1-R, etc., Cass and Berrien Counties;

Mich.—**Alpine Constr. Co. & Straits Constr. Co.**, St. Ignace, Mich. CA $646,634, est. $660,000 stabilized aggregate 7.227 mi. M-66, F 71-17 C6-R, F 71-17 C7-U, Presque Isle Co.;

Mich.—**L. W. Edison Co.**, 924 Floral Dr. S. E., Grand Rapids, Mich. CA $715,964, est. $770,000. c. conc. 2.677 mi. US-131, M 41-85 C2-RN, Kent Co. Grand total $3,125,608. CD 5/3, under LB.

BUILDINGS—LB & CA

▲ **American Bridge Co.**, Ambridge, Pa., CA Est. $2,025,000, electric furnace SHOP, CLEVELAND, O. Jones & Laughlin Steel Co., 401 Liberty Ave., Pittsburgh, Pa. Grand total est. $3,180,000. Awarded Apr. 10.

McDowell Co., 3203 W. 71 St., Cleveland 4, O. CA est. $755,000, design and construct, stripper and mold conditioning bldg. (Cleveland, O.). Awarded Apr. 5;

Fort Pitt Malleable Iron Div. of Steel Trading Corp., McKees Rocks, Pa., CA Est. $400,000 steel erection to open hearth bldg. (Cleveland, O.);

Vogt & Conant, 1585 E. 40 St., Cleveland, O., CA Est. $400,000, open hearth bldg. exten. (Cleveland, O.). Awarded April 1956.

▲ **Byron C. Jilek**, Worthington, O. and **Erwin J. Fanta**, 2117 Iuka Ave., Columbus, O. Owner Builds. $1,500,000. 80 HOMES, REYNOLDSBURG, O.

▲ **Westinghouse Electric Corp.**, P.O. Box 868, Pittsburgh 30, Pa. CA Est. $8,000,000. Unit 6, St. Clair POWER PLANT, 300,000 kw. turbine generator, MICHIGAN. Detroit Edison Co., 2220 Second Ave., Detroit 26, Mich.

▲ **A. L. Jackson Co.**, 300 W. Washington St., Chicago, Ill., CA, $3,500,000. FACTORY and OFFICE BLDG., Central Rd., MOUNT PROSPECT, ILL. Charles Bruning Co., 4700 W. Montrose Ave., Chicago, Ill.

▲ **Joseph J. Duffy Co.**, 4994 N. Elston Ave., Chicago, Ill., LB $1,628,713, 2 and 4 story, brick, steel, concrete ACUTE HOSPITAL, Tinley Park, TINLEY PARK, ILL. State, Dpt. P. Wks. & Bldgs., Armory Office Bldg., Springfield, Ill. CD 3/23/55.

▲ **Malpeli Constr. Co.**, 28980 Inkster Rd., Birmingham, Mich. Owner Builds. $3,750,000. San Marino Villas, 123 HOMES, Pebblebrook Ave., FRANKLIN, MICH.

▲ **Marlboro Homes**, Middlebelt and St. Joseph Sts., West Bloomfield, Mich. CA Est. $2,500,000. Pine Lake Manor HOMES, Middlebelt, Orchard Lake and Maple Rds., WEST BLOOMFIELD, MICH. Sylvan Realty Co., (agt), 2383 Orchard Rd., Pontiac, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 24 Missouri — May 25 North Dakota
STREETS AND ROADS
May 22 Kansas, Nebraska — May 24 Missouri
May 25 North Dakota

▲ **Tex., Lubbock**—BA 5/24—City, City Hall, laying 137,000 lin. ft. water supply line from Shallowater to Muleshoe, mostly gravity flow 42 in. pipe. $2,000,000. John Hickerson, city engr. CD 5/4.

BUILDINGS—BA

▲† **N. M., Albuquerque**—BUILDING—BA 6/14—Atomic Energy Comm., 4001 Gibson Blvd. S.E., 2 story, masonry, 80,000 sq. ft. bldg., Sandia Base, Inv. 292-56-25. $1,000,000-$1,200,000.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
June 4 Oregon — June 6 California
STREETS AND ROADS
June 4, 5 Oregon — June 6, 7 California

HEAVY CONSTRUCTION—LB & CA

▲† **Oberg Bros. Constr. Co.**, 734 Howard St., Los Angeles, Calif., LB $1,211,657 (5 bidders) Eaton Wash channel, Huntington Dr. to Encinita Ave., Temple City, Los Angeles Co., CIVENG-04-353-56-44, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids May 8. CD 5/2.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
May 23 Ontario — June 27 British Columbia
STREETS AND ROADS
May 23 Ontario — May 24 British Columbia

BUILDINGS—BA

▲ **Que., Baie Comeau**—PLANT, etc.—Bids Asked—Canadian British Aluminum Co. Ltd., 1980 Sherbrooke St. W., Montreal, plant and office, first stage of aluminum shelter plant. Total est. $72,000,000. Meadowcroft & MacKay, 4115 Sherbrooke St. W., Montreal, archts. C. D. Howe Co. Ltd., 1421 Atwater St., Montreal, engrs. CD 4/30.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

B. C.—**Mannix-Marwell**, c/o 1500 W. Georgia St., Vancouver, B. C., CA, $813,695. Section 71, bit. surf. Kootenays Area;

B. C.—**Dawson, Wade & Co. Ltd. and Commonwealth Constr. Co. Ltd.**, c/o 775 Clark Dr., Vancouver, B. C., CA $719,181. Section 69, bit. surf. roads in Yale, Kamloops and Similkameen areas;

B. C.—**Storms Contg. (Pacific) Ltd.**, 342 W. Pender St., Canouer, B. C., CA, $780,242. Section 70, bit. surf. roads in Okanagan Area. Bids Apr. 19, awarded May 2. CD 4/26, under LB.

▲ **Piggott Constr. Co. Ltd.**, 12522 126 St., Edmonton, Alta., CA, $1,538,118, grading Mile 194 to Mile 249.5, Fort St. John line of Pacific Great Eastern Ry., BRITISH COLUMBIA. B. C. Govt., Parliament Bldgs., Victoria, B. C. Awarded May 3. CD 2/12/54.

▲ **Schwenger Constr. Co.**, Parkside Dr., Hamilton, Ont., CA, $1,076,728 (4 bidders) filtration plant, CORNWALL, ONT. City, City Hall, Cornwall, Ont. Bids Apr. 16. CD 3/19.

▲ **Marine Industries Ltd.**, 1405 Peel St., Montreal, Que., LB $4,897,146, dredging in Montreal Harbor, MONTREAL, QUE. National Harbors Bd., West Block, Parliament Bldgs., Ottawa, Ont.;

United Dredging Co. Ltd., 5035 Western Ave., Montreal, Que., LB $1,930,000 jetty at Elevator No. 1 Montreal Harbor (Montreal, Que.).

BUILDINGS—LB & CA

▲ **Allwood Constr. Co. Ltd.**, 47 Ingram Dr., Toronto, Ont. Owner Builds. $2,000,000. OFFICE and APARTMENT BLDG., old city hall site, OSHAWA, ONT. CD 5/9.

▲ **Robertson-Yates Corp. Ltd.**, Box 301, Hamilton, Ont., CA, $1,000,000, 2nd phase PLANT (less steel) OTTAWA, ONT. Soules Constr. Ltd., 880 Bay St., Toronto, Ont.

ALASKA

BUILDINGS—LB & CA

▲† **Nelse Mortensen & Co.**, 1021 Westlake Ave., North Seattle, Wash., LB $1,184,617 (7 bidders) POST OFFICE, Federal COURT HOUSE, NOME, ALASKA. P. Bldgs. Service, General Services Admin., 19th and F Sts N. W., Wash. 25, D. C. Bids May 8. CD 4/2.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—BA

▲† **Guam, Marianas Islands, Agana**—BOQ QUARTERS—BA 6/25—Chief of Bureau Yards & Docks, Naval Contr. Div., 333 Fell St., San Francisco, Calif., bachelor officers quarters 2nd increment operation bldg., tacan bldg., runways, 2 warehouses, bridge, etc., NBy 3315. Est. $9,000,000. CD 7/23/48.

(Proposal Advertisements see p. 187 to 190)

Alameda Naval Air Station — Photo courtesy Clyde Sunderland — Oakland

From Bay-bottom to airport runways at record low cost

BITUMULS®-treated sand/clay solves Navy paving problem at Alameda, California

TODAY, the runways of the Alameda (Calif.) Naval Air Station carry the heaviest of aircraft traffic, both in weight and volume.

Yet these same runways were constructed from sand/clay fill, dredged from the bottom of San Francisco Bay at a "bargain cost." The key to this performance and economy has been *Bitumuls Emulsified Asphalt Stabilized Base*. About 3 million sq. yds. of paved area at this Air Station have been built over a period of some 15 years; and during that time the savings as compared with alternate proposals have mounted to more than one million dollars.

Alternate methods considered by the Engineers of the Public Works Office were the construction of asphaltic concrete or macadam types that required the costly importation of crushed aggregate from long distances; or the treatment with Bitumuls of native red rock from the foothills. For these types over 500,000 tons of aggregate would have had to be imported for an average 5" depth of pavement base.

The dredged-in-place sand/clay from the Bay-bottom was stabilized with Bitumuls (about 6% average). This not only gave adequate bearing value at lower cost, but provided other unique advantages, such as:

1. **FLEXIBILITY**, for conformance to minor expected settlement.
2. **RESISTANCE TO ABSORPTION** of capillary moisture from the sub-base (only 3 ft. approximately above tide level).
3. **SPEED OF OPERATIONS** — Mixing Grade Bitumuls could be easily mixed with the damp sand/clay at record speeds compared to other types.

Bitumuls continues to be used at this Air Station in sand/clay mixes of varying designs to provide adequate load-bearing capacities for various types of pavement base. With increasing traffic and heavier loads, many of these areas have been surfaced with wearing courses, such as Asphaltic Concrete, Bitumuls Armorcoats or Surface Treatments.

An important factor in this very successful paving operation was the use of special grades of Bitumuls that are treated for use with hydrophilic or water-preferential sands. Full information on these products is available at a Bitumuls office near you.

Applying Bitumuls to windrowed sand/clay material. *(Official United States Navy Photograph)*

The Bitumuls-stabilized sand/clay is spread, then compacted to specified density.

American Bitumuls & Asphalt Company

200 Bush St., San Francisco 20, Calif.

St. Louis 17, Mo. — Cincinnati 38, Ohio — Perth Amboy, N. J. — Baltimore 3, Md.
Tucson, Ariz. — Inglewood, Calif. — Mobile, Ala. — San Juan 23, P. R.
Oakland 1, Calif. — Portland 7, Ore.

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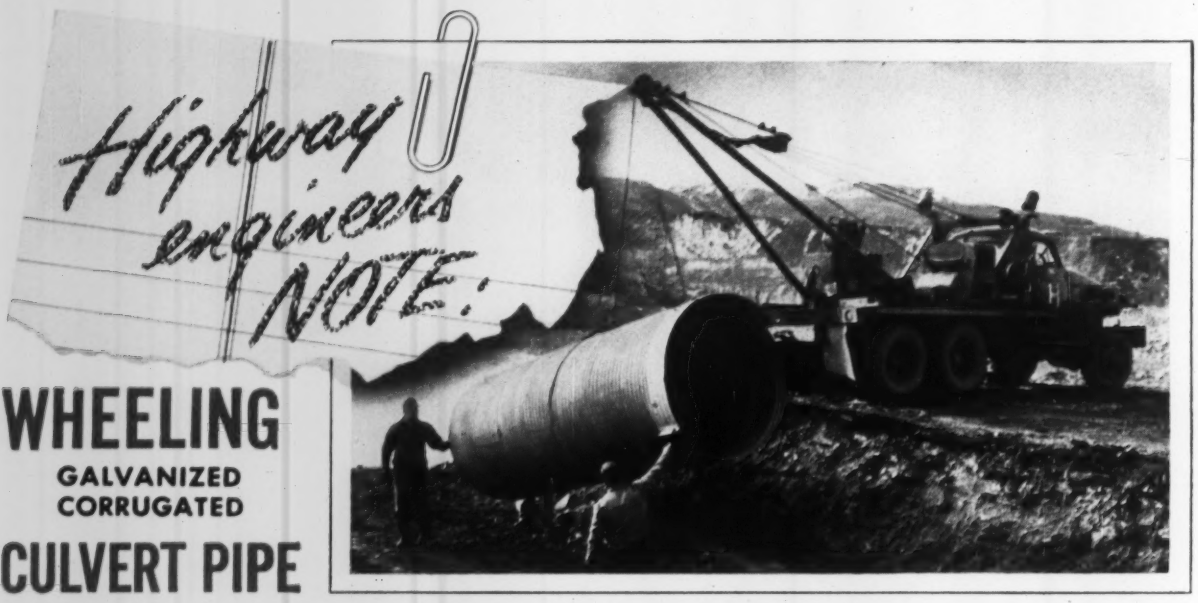

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GALVANIZED CORRUGATED
CULVERT PIPE

delivered where you want it when you want it!

Wherever you build, *whatever* you build, Wheeling stands ready to immediately deliver the type of Wheeling Galvanized Corrugated Culvert Pipe or Pipe Arch that best answers your needs. You may specify Copper Steel or Pure Iron plain galvanized or bituminous coated (with or without paved invert) in a wide range of gauges and diameters.

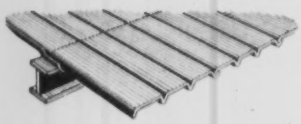
Wheeling's network of warehouses is strategically located throughout the country to assure you immediate job-site delivery on most items.

For full details and specifications contact the Wheeling warehouse or sales office nearest you.

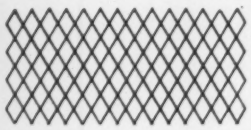
Manufactured to comply with Federal and all state highway specifications.

Wheeling

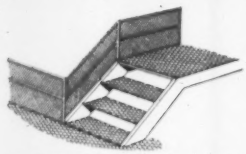
Use these other Wheeling products for economical, long-lasting construction



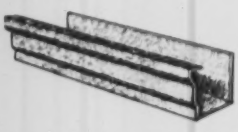
Tri-Rib Steel Roof Deck—Lighter, stronger, saves structural steel, cuts gross weight as much as 40%.



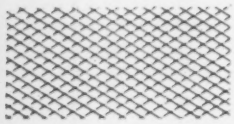
Steelcrete Expanded Metal for Reinforcing — Distributes concentrated loads over a larger area.



Expanded Metal Railings, Guards, Treads, Walkways. Cuts maintenance. Permits full visibility and ventilation.



Gutters and Leaders—Heavy pure zinc coating. Provides long life, rust-resistance, sure protection.



Metal Lath—Provides the best plaster bond for crack-free walls, complete design flexibility.

SOFTITE, Cop-R-Loy: the tightest-coated Galvanized Sheet. Coating won't peel no matter how severely formed.

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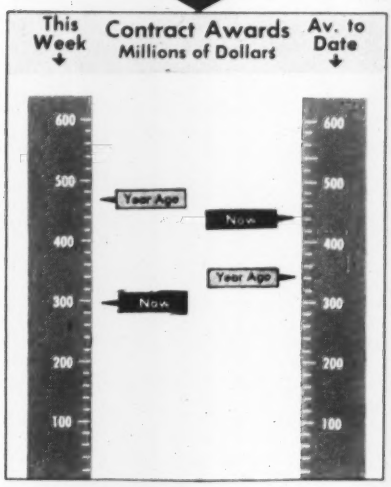
Wheeling's Warehouses are strategically located throughout the country to give you speedy, on-time delivery on all warehouse-stocked items. Consult the 'Yellow Pages' for the Wheeling warehouse or sales office nearest you. ***Warehouses:*** Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis. ***Sales Offices:*** Atlanta, Houston.

Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 20 wks 1956	Chge %
	$ millions		
Federal	$54.5	$710.8	+5
State and Municipal	108.6	2,401.3	+23
Total Public	163.1	3,112.1	+18
Total Private	137.1	5,756.7	+28
U. S. Total	$300.2	$8,868.8	+24
By Type of Work			
Waterworks	$4.9	$114.4	+16
Sewerage	6.4	240.6	+58
Bridges	5.5	221.5	+25
Highways	49.7	883.3	+17
Earthwork, Waterways	14.2	274.7	+37
Buildings:			
Public, Excl. Hsg.	51.9	767.3	+20
Public Housing	.5	146.4	+31
Private Housing	67.9	2,430.1	−9
Commercial	12.7	746.1	+19
Industrial	47.1	2,290.9	+135
Unclassified	39.4	753.2	+3
U. S. Total	$300.2	$8,868.8	+24

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

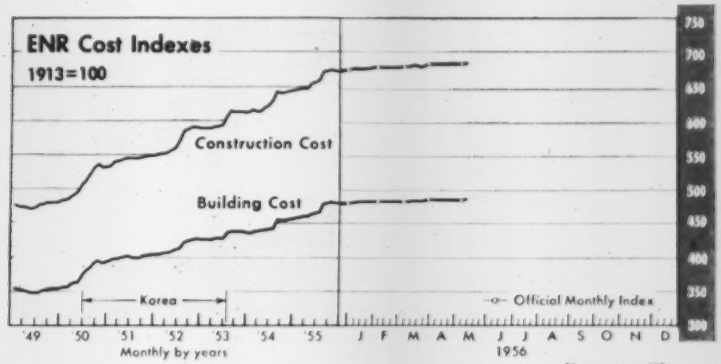
NEW CAPITAL FOR CONSTRUCTION

	Week of May 10 1956	Cum. 19 wks 1956	Chge '55-'56
	$ millions		%
Corporate Securities	$198.7	$1,527.0	+21
State and Municipal:			
All Except Housing	112.1	1,694.6	+16
Housing	...	20.3	−56
Federal Loans	2.0	40.5	+6
Federal Aid	...	...	−100
Total Nonfederal	$312.9	$3,282.4	+13
Federal Appropriations:			
In U. S.	...	34.4	−42
Outside U. S.	...	...	...
Total New Capital	$312.9	$3,316.8	+12

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	May 10 1956	Percent Change from last Month	Year
Construction Cost	688.72	+0.8	+5.3
Building Cost	487.65	+0.2	+5.2

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.845. 1949 = 100: Divide Construction Cost by 1.770; Building Cost by 3.518.



CONTRACTS AWARDED Millions of dollars	1956 April	4-Mos.	Percent Change from 1955 April	4-Mos.
Total U. S., ENR reported	$1,868.7	$7,622.0	+29	+31
Private	1,266.4	5,010.3	+52	+37
Public	602.3	2,611.7	− 2	+21
State and Municipal	502.0	2,033.0	+ 3	+26
Federal	100.3	578.7	−22	+ 5
ENR Volume Index, 1913 = 100	764	733‡	+25	+26

NEW CAPITAL FOR CONSTRUCTION Millions of dollars				
Total U. S.	$711.6	$2,700.8	+44	+16
State and Municipal Bond Sales	272.5	1,490.3	−0.1	+11
Corporate Security Sales	427.1	1,139.3	+119	+19
Federal Loans, Aid (nonfederal work)	11.9	36.8	+110	+34
Federal Appropriations (federal work)	...	34.4	*	*

* No appropriations in 1955 period

MATERIALS SHIPMENTS Unit	1956 Jan.(J) Feb.(F) Mar.(M)	Mos.(1) Mos.(2) Mos.(3)	Percent Change from last Mo.	Year Cum.
Portland Cement, Bur Mines thous bbls	13,273(J)	13,273(1)	−0.3	−0.3
Concrete Paving Awards, PCA thous sq yd	8,362(M)	23,541(3)	−12	− 2
Fabricated Structural Steel thous tons	307(M)	844(3)	+35	+26
Bookings, AISC thous tons	366(M)	1,102(3)	+28	+45
Reinforcing Bars, Net, AISI thous tons	174(F)	356(2)	+35	+46
Lumber, NLMA mil fbm	2,966(F)	5,870(2)	0	+ 1
Orders mil fbm	2,965(F)	6,098(2)	− 2	+ 1
Production mil fbm	2,915(F)	5,848(2)	− 1	+ 2
Douglas Fir Plywood, DFPA, 3/8" basis				
Production (aver. per week) mil sq ft	106.5(M)	104.7(3)	+10	+ 9
Orders (average per week) mil sq ft	96.6(M)	97.6(3)	+ 2	− 2
Clay Products, Bur Census				
Brick, Ungl, Common, Face mil bri	434.7(J)	434.7(1)	+ 6	+ 6
Vitrified Clay Sewer Pipe, thous tons	121.0(J)	121.0(1)	+20	+20
Structural Tile, Unglazed, thous tons	54.2(J)	54.2(1)	−15	−15
Asphalt Products, Bur Census				
Asphalt Roofing thous sales sqs	4,624(F)	7,812(2)	+32	+12
Asphalt Siding thous sales sqs	112(F)	195(2)	+37	+16
Aluminum Products, Net, Bur Census **				
Sheet and Plate, Non-Heat-Treatable mil lb	91.6(F)	188.7(2)	+25	+27
Wire and Cable mil lb	24.3(F)	48.4(2)	+27	+24
Extruded Shapes, Soft Alloys mil lb	51.4(F)	106.5(2)	+18	+24
EMPLOYMENT AND FAILURES				
Contract Const Employ, BLS thous	2,316(M)	2,278(M)‡	+ 3	+ 3
Contractor Failures, Dun & Bradstreet Number	150(M)	417(M)	+39	+35
Liabilities thous	$7,089(M)	$23,133(M)	+59	+ 9

** New series
‡ Average per month

With Kwik-Mix R-15 Moto-Bug® you get

3 TOOLS IN ONE

15 cu. ft. hopper body — Big-capacity R-15 Moto-Bug hauls concrete, plaster, mortar, brick, tile, and any other construction materials or supplies you shovel, pile or stack into the gravity-dump hopper. It carries up to 2000 pounds or 15 cu. ft. of bulk materials each load — takes a full batch of concrete from an 11-S mixer. Gravity dumping is instantaneous, or can be snub-line controlled.

2000-pound platform — Change from hopper body to platform, and you have a heavy-duty, 1-ton capacity truck for hauling concrete blocks, stone slabs, sacked cement and other bulky materials. Moto-Bug platform has a load area of 34 x 54 inches, and is equipped with stake pockets for sideboards. Platform tilts for unloading—has same gravity-dump principle as hopper body.

7-foot fork lift attachment lets you use the R-15 Moto-Bug for lifting, loading and unloading. It's readily interchangeable with hopper or platform — lifts 1500 pounds to 7-foot height. Hydraulic power raises and lowers load. Mast can be tilted back 10° when carrying load — or 2° forward for pick-up or releasing load. Forks are 24 to 30 inches long — adjustable 6 to 32 in. wide.

mail to: KWIK-MIX COMPANY, Port Washington, Wis.
Send us literature on: ☐ R-15 Moto-Bug ☐ S-10 Moto-Bug

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CITY, STATE _____ CKMS5SREV. EAR

KWIK-MIX COMPANY

PORT WASHINGTON, WIS. (Koehring Subsidiary)

Also: CONCRETE • BITUMINOUS • PLASTER-MORTAR MIXERS

R-15 Moto-Bug travels 6 m.p.h. forward and reverse, has automotive-type brakes. Clutch lever and brake pedal are within easy reach of seated operator. There's 18 to 1 gear reduction ratio on steering wheel. Turning radius is only 80 inches — overall width, 35 inches. It is powered by 8.3 h.p. gas engine (electric starter optional). There's a choice of pneumatic tires or solid-rubber, soft-core tires. Dual drive tires are optional, give extra traction, flotation, stability for work on or off pavement.

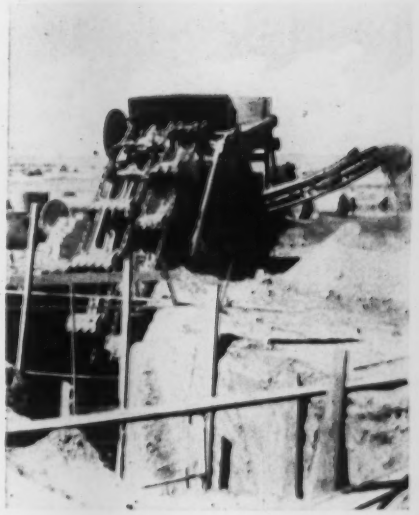
3-tool usefulness is available in 2 sizes of Moto-Bugs

S-10 Moto-Bug — For smaller jobs, Kwik-Mix also brings you 3-tool versatility in a 6 h.p. Moto-Bug. This S-10 model has 10 cu. ft. capacity as a power wheelbarrow — 1500-pound load capacity as flatbed truck — and 1000-pound (6-foot) fork lift attachment, all interchangeable. Operator rides on rear step — has safe, automatic "deadman" brake control. A small investment in Moto-Bug can earn big savings in time and labor on your work. Check on both sizes — see your Kwik-Mix distributor or write us.

Dig 6 feet wide with 310 Trenchliner®

Equipped with dual booms, big-capacity 310 Trenchliner digs 6-foot trench at depths to 12 feet. With single boom it has 1½ to 4½-foot widths, and 17-foot maximum depth. Digging speeds range from 5 inches to 20½ lineal feet per minute. Power-shift spoil conveyor discharges to either side of machine. There's full reverse of all operations for undercutting, making vertical setins. Parsons line also includes 4 smaller heavy-duty trenchers.

PARSONS • Newton, Iowa
(Koehring Subsidiary)



Lo-Bin® for batching or transit-mix

As a batch plant, Johnson Lo-Bin can be arranged with 2, 3 or 4 aggregate compartments. For transit-mix, one compartment can be used for bulk cement. It has 22 or 44 cu. ft. batcher, up to 4 weigh-beams. Batcher rides out beyond end of bin, dumps onto conveyor, or mixer skip (serves 6-S to 28-S mixers). Lo-Bin has 8, 20, 30-ton capacity, is only 7½ to 9½-ft. high — easily charged by tractor loader. Optional: wheels, tires, tow-bar.

C. S. JOHNSON • Champaign, Ill.
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86.7 batches per hour with 34-E *twinbatch*®

Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E *twinbatch*. Also check rubber-tired 16-E.

KOEHRING Company
Milwaukee 16, Wis.

V67

Breaker Parts by AMSCO®
Cut Costs Where It Counts

Impeller Bars, Breaker Bars and Liner Plates of extra tough Amsco Manganese Steel reduce wearing action.

The violent breaking action of primary rock, the high-speed impact of stone thrown by impeller bars against breaker bars and liner plates, give this breaker a terrific pounding. These parts are designed for minimum wear with Amsco Manganese Steel . . . in this heavy-duty "Cedarapids" Model 5360H Impact Breaker, produced by Iowa Manufacturing Company.

Amsco Manganese Steel crusher parts, made of "the toughest steel known", give a much longer life span to these main wear points. This extra-tough steel work-hardens under impact. Abrasion polishes manganese steel, and yet it retains high-ductility qualities.

Breaker parts by Amsco *cut costs where it counts* . . . by reducing parts-replacement time to a minimum, and by giving much longer service life between repair periods.

Amsco makes manganese steel breaker parts for most major manufacturers of crushing, grinding and pulverizing equipment. Call your manufacturer's representative for further information on Amsco breaker parts.

AMERICAN Brake Shoe COMPANY

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American Manganese Steel Division • Chicago Heights, Ill.

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STEEL: Another Price Boost Is on the Way

Construction, which was hit by a substantial hike in steel prices in 1955 (roughly 8% on structurals, for example), can expect an even bigger price boost this year—probably by late summer.

For several months, prominent steel company executives have hammered at a single theme—that unless the government gives them special tax aid through revised depreciation schedules, the next price increase for steel must be a big one. The reason represents a novel economic theory: Higher prices are needed not only to pay higher costs that will follow a new wage pact but also to fatten profits to pay for the steel industry's ambitious expansion plans.

Last week, for example, U. S. Steel Chairman Roger Blough told stockholders that the corporation plans to add 1,000,000 tons of capacity in the next ten years, at a cost of $1.5 billion, and expects to spend another $1.5 billion to replace or modernize obsolete or worn-out facilities. And, said Blough, U. S. Steel's present earnings level ($370 million in net profits in 1955), can't support or finance the heavy capital expenditures the company must make to meet demand.

U. S. Steel's position is almost identical with that of other major producers. Two men, National Steel Corp.'s Earnest T. Weir and Bethlehem's Eugene G. Grace, also were among those arguing for the double price rise—the one to pay for expansion, the other to pay for higher labor costs.

And, C. M. White, president of Republic Steel, which is financing almost all of its current expansion out of retained earnings, is now calling for higher prices in order to "create an earnings base which will support large borrowings and encourage investment" for the company's future expansion.

• Congressional Probe Possible

If the steel industry's warnings of higher prices were based solely on the almost certain prospect of higher wage costs, few eyebrows would be raised. But the industry's idea of raising prices to pay for expansion is something else. That already has made it at least a possibility that Congress will take a look at the steel companies' position.

Under a little-noticed section of its report to Congress last March, the Congressional Joint Committee on the Economic Report has had its staff busy for several weeks on a study of the relationships between prices, wages and profits. Steel is beginning to develop as a major target for this probe.

• Who Pays for Expansion

One thing the Congressional group undoubtedly is questioning is whether it is sound from an economic standpoint to put the burden of expansion on the industry's customers—such as construction—instead of on the investors. If construction, and other major steel users, pay higher prices for steel to give the companies bigger profits and greater retained earnings to finance construction of new facilities, the customer, in effect, is paying for the new capacity.

The Joint Committee is not likely to question the need for expansion, but it is concerned over the long-range effects of saddling steel users with a price increase for expansion—at a time when steel prices and steel profits are both high.

They feel it could affect industrial expansion to some degree, because of its effect on construction costs and manufacturing costs. For the steel companies themselves, the problem of rising construction costs presents a variation of the chicken-and-the-egg riddle. A major reason for higher prices, the steel companies say, is that it costs them much more to build new facilities now. But steel price increases have certainly played a big part in pushing construction costs higher in the past—and will do so again. In effect, when steel companies raise their prices, they are also raising their own construction costs.

• "Realistic" Depreciation

Despite these questions, steel industry representatives are not worried about Congressional hearings; they feel they have a strong case to present. And, to judge from statements by Blough and other top steel men, their biggest point will be that depreciation schedules should be revamped to cut the companies' tax burden and permit them to set aside more earnings for expansion.

They are bearing down hard on the depreciation issue because the benefits of the fast tax write-offs issued to spur steel expansion during the Korean conflict will drop off materially in 1957 and 1958.

While the 1954 tax revision that permitted businesses to use the "declining years" or "sum of the digits" methods of depreciating their plant and equipment has proven more helpful to many companies than the fast tax write-offs of the Korean War era, steel companies say it doesn't solve their problem—because of the size of the planned expansion programs, and the long amortization period.

But, Congress is not likely to grant any special tax amortization privileges to the steel industry in the foreseeable future. And without a "more realistic depreciation policy", the steel industries say the only alternative is higher prices.

In this situation, how much more can construction expect to pay for steel? Most steel leaders have hedged on this point, commenting that the total price rise can be calculated only after the new wage contract is negotiated. But one man, Pittsburgh Steel's President Avery C. Adams has already spelled out his views. Adams says the price increase should be $12 to $15 a ton (as against an average increase of $7.35 a ton in 1955)—and other steel men haven't made any public move to trim Adams' estimate.

Boycott Urged

Texas roadbuilders fight use of escalator clauses

The Texas Highway Branch of the AGC has declared war on price escalator clauses in steel and cement suppliers' contracts. The board of directors of the roadbuilders' unit, in formal resolutions, called on the suppliers to drop the clauses as quickly as possible.

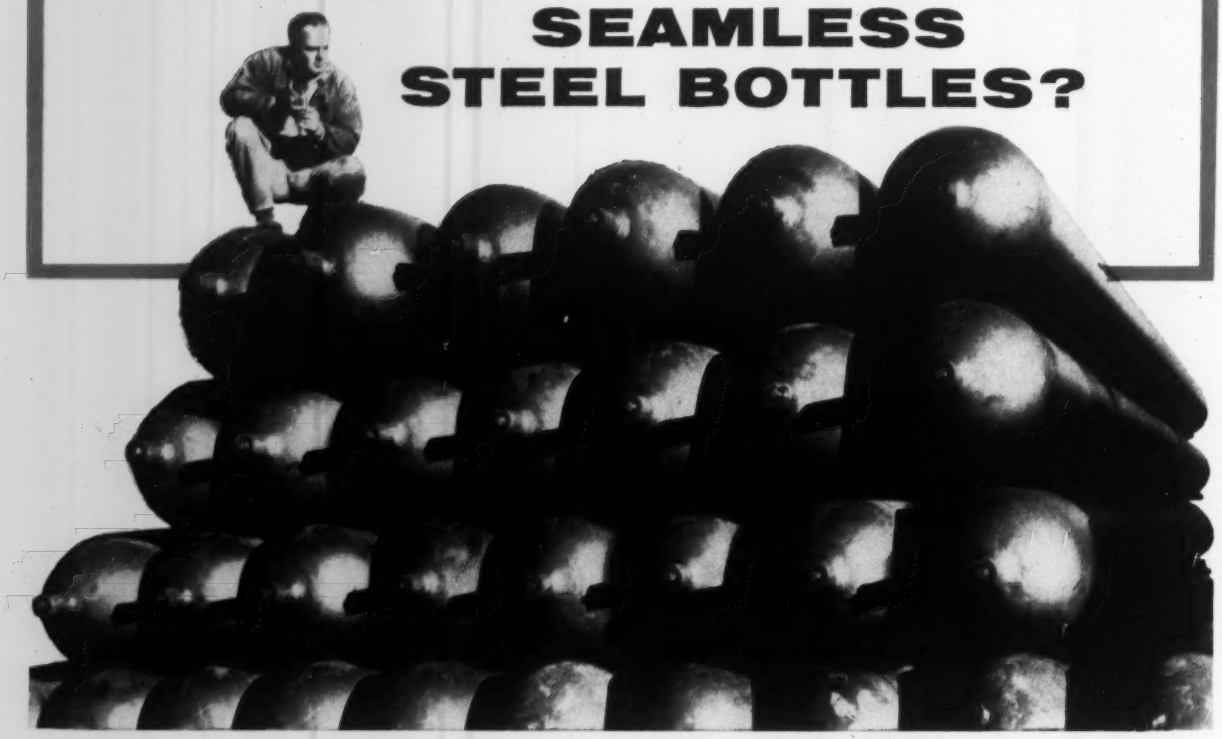
To add punch to their protest, the roadbuilders' officers urged highway contractors to boycott steel and cement companies that insist on using the controversial escalator clauses.

Asserting that steel and cement companies should assume "their responsible share of the risk involved in highway and heavy construction along with the contractors and other material suppliers," the roadbuilders called for quotation of firm prices for materials during the entire period covered by a particular construction contract.

(B&F continued on page 177)

What's so good about underground gas storage in

SEAMLESS STEEL BOTTLES?



A FAIR QUESTION — AND AN EASY ONE TO ANSWER.

UNDERGROUND GAS STORAGE IS PRACTICAL

Fifty of these Seamless Steel Bottles, each averaging 39 feet in length and 24 inches in diameter, will hold 1¼ *million* cubic feet at 2240 psi. Once installed in the ground, the bottles will not vibrate and settle like a surface installation will. And because underground temperatures are relatively stable the year round, there is little or no fluctuation in gas pressure.

UNDERGROUND GAS STORAGE IS ECONOMICAL

Seamless Steel Bottles call for virtually no maintenance. Unlike aboveground installations, these bottles do not require periodical painting, nor do they need constant inspection against the elements. Moreover, any group of bottles can be taken off the line for inspection or repair at any time without interrupting the gas pressure of the other groups of bottles.

UNDERGROUND GAS STORAGE IS SAFE

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UNITED STATES STEEL

April Housing Starts Trail '55 Rate by 20%

The hoped-for upturn in housing starts failed to materialize in April. The government's April estimate, announced yesterday, was 106,000 starts, of which 1,000 were public housing units, and 105,000 represented private work. It was the lowest April total since 1951, and the lowest April figure for private starts since 1952.

The seasonally-adjusted annual rate for April was 1,110,000 starts, far below the 1,350,000 annual rate posted for April, 1955.

Private starts last month were up 11.2% over March, reflecting a seasonal rise. But the March-to-April gain was the smallest since 1952. Last year, April starts were up 16% over March. In 1954, April ran 14% above March, and in 1953, 11.8%.

This was not a one-month phenomenon. The four-month total for private work is 349,900, down 16% from the comparable 1955 period, trailing by about 70,000 units.

On a direct month-to-month comparison with 1955, housing starts so far this year show a consistent, substantial decline. January's total was 16% under 1955. February trailed by 13%. March fell 16% behind the 1955 pace—and April was down 20% from a year ago.

The continued downturn in housing starts doesn't come as a surprise. This spring, some economists predicted that homebuilding would drag along for a few more months because of a dip in applications for FHA commitments and VA appraisals—both regarded as advance indicators of housing activity (ENR Mar. 22, p. 106).

The drop in financing applications came when FHA and VA financing terms were tightened last summer. But economists pointed out that the full effect of this cutback wasn't felt immediately. Apparently, it is still a factor this spring.

Tight money is generally getting the blame for the slowdown in housing. Its effects have not been uniform throughout all sections of the nation. Builders planning mass housing projects near the urban "money centers" apparently have had less trouble getting financing than their counterparts in non-metropolitan regions.

In some cases, particularly in the less-populated areas, builders and buyers have been hit by mortgage discounting on FHA and VA loans. Because the interest rates on FHA and VA mortgage loans are pegged (they cannot fluctuate to reflect the changing demand and supply of mortgage money), lenders frequently buy these loans below par. This discounting has been heavy at times and the builder often has had to absorb the added financial burden.

Last week it became clear that the practice will go on without any governmental restraints. The House Veterans Affairs Committee, investigating the mortgage discount problem—and the whole matter of housing loans for veterans—heard top Administration housing officials condemn heavy discounts of FHA and VA loans. But the officials made it clear that an outright legislative ban on such discounts might do more harm than good for the housing market. They pointed out that a similar move in 1953 led lenders to avoid making VA loans for several months.

Because housing officials had no alternative to suggest, the Congressional committee dropped its proposed legislation.

The House committee did win one point in its drive to aid veterans who want to buy homes. But the victory was a small one that will not have much effect on overall housing activity. Veterans in "scarce-money" areas who cannot get a VA mortgage from local lenders can apply to the Veterans Administration for a direct loan, and get faster action.

For some time, the VA has turned such requests over to a committee formed by private lenders. This committee tries to place the loan with a bank, savings and loan association, or other lender—generally in one of the principal money centers. Sometimes, however, it takes months to find an investor.

With no help in sight on the financing front, and a four-month drop in housing starts, some observers feel that any later pickup in housing will not be enough to put 1956 in the same class with 1955.

And, with April's housing start figures in hand, they find it difficult to string along with Housing Chief Albert Cole's oft-repeated prediction that housing starts will total 1,300,000 this year.

ENR's own housing contract figures, which also serve as an indicator of housing starts, are not encouraging, as of now. Although the mass housing awards started off strong, keeping even with last year's pace, the totals have started to slide in recent weeks now, with the figures in for the first 20 weeks, mass housing contracts are trailing 1955 by 9%.

Homes Leased as Schools

A Dayton, Ohio, homebuilder has come up with an idea that partially overcomes one of the objections to mass homebuilding—lack of school classrooms to take care of the children of new families that pour into the community when a new development springs up.

Huber Construction Co. has set aside 35 homes in its new 2,000-home Huber Heights Development for use by the local township as classroom buildings. The homes, which will be leased to the local School Board for $1 a year, will be built without partitions. Each will accommodate 39 students. When permanent school facilities are built, the homes will be returned to Huber who will then install partitions and sell the houses.

Canadian Boom

Industrial building paces four-month award activity

Contract awards for heavy construction in Canada, as reported by ENGINEERING NEWS-RECORD, are running 29% ahead of last year on the basis of the first four months.

Industrial building awards for the first four months more than doubled the 1955 rate and gave this category a dollar volume of $169 million (out of $627 million for all types of work).

Major projects such as a $50-million power plant on the St. Maurice River and a $16-million paper plant for Quebec helped to push industrial building into the No. 1 spot, well ahead of mass housing.

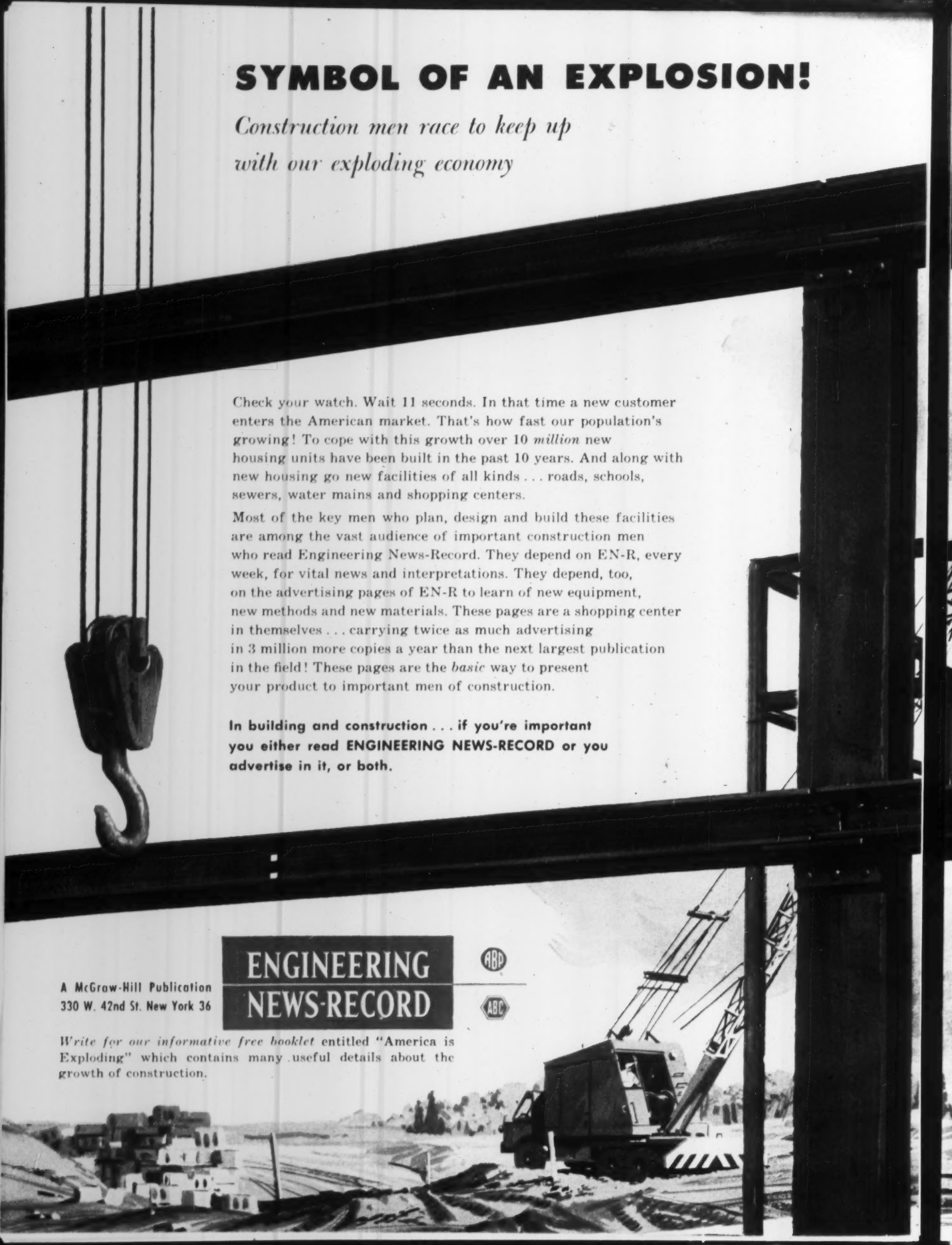
Despite a 30% drop from last year's comparable period, mass housing held the No. 2 spot in Canadian contract awards for the first four months. The decline in the early part of this year contrasts sharply with the tremendous volume of housing awards in the latter part of 1955. In December alone, mass housing awards added up to $180 million. For the first four months of this year, awards total only $127.7 million.

Public works are booming in Canada, with awards of $218.7 million topping 1955 by 32%. The St. Lawrence Seaway has contributed major contracts to the earthwork-waterways category, which leads public works categories with a total of $58 million, up 10% over last year's heavy volume.

(B&F continued on page 182)

SYMBOL OF AN EXPLOSION!

Construction men race to keep up with our exploding economy



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Cutting It Thin

FHA, builders agree on size of One-Inch-Board

After nearly a month of controversy, FHA Administrator Norman Mason last week closed a 1/32nd of an inch gap that separated the housing agency and some unhappy West Coast builders. He told FHA field offices to accept for an "indefinite" period, "one-inch" boards that are 24/32nds of an inch thick, instead of the 25/32nds called for in FHA regulations.

The trouble started when the Portland, Oregon, FHA office rejected some houses built under the West Coast Lumber Inspection Bureau's new Grading Rule 15, effective March 15, permitting the thinner board. FHA officials said the new size didn't meet their regulations.

Complaints by the builders to the NAHB and to Sen. Wayne Morse (D-Ore.), stirred up a small hornet's nest in Washington—and put FHA Administrator Mason on the spot. Investigation of the Portland situation led to Mason's decision to temporarily permit builders to go ahead under the new grading rule, until a final agreement could be worked out. Two weeks ago, the American Lumber Standards Committee (whose standards are followed by FHA), voted to accept the thinner board.

Work Put-in-Place Matched 1955 Pace

Construction expenditures for work put-in-place in April topped the March figure by 9%, reflecting an expected seasonal upturn, and matched the April 1955 total which was a record for the month.

The four-month, January to April total for this year is $11.8 billion, running even with the same period last year. Not all categories maintained the 1955 pace, however.

Private residential building in April amounted to $1.2 billion, according to the joint Commerce and Labor Department report. This was down 8% from 1955's record level. On a four-month basis, private homebuilding trails 1955 by 6%.

• **New records**—April records for work-put-in-place were posted by several major types of construction, according to the government. Highways were up 4% for a new April record and private industrial building posted a 28% rise over April 1955, to set a new high for the month.

Other monthly records were set by commercial building, up 18% over the same month in 1955 and sewer and water facilities, 16% above the same month last year.

For the first four months of this year, private construction put-in-place totaled $8.7 billion, while public works accounted for $3.1 billion.

• **Expanding economy**—The surge in industrial building and commercial building is pointed up by the government's figures for the January through April period.

Private industrial building in that period is up 22%. Commercial building for the same four months is running 25% ahead of the comparable 1955 period. Public service enterprises are up 115% over last year.

Public industrial construction, the category in the government report that is dominated by Atomic Energy Commission work, is down 59% for the first four months. It is the only major category, other than private residential building, to show a decline from last year.

Business Briefs . . .

• **Expansion planned**—Westinghouse Electric Corp. expects to spend $300 million to $375 million in the next five years on expansion, plant modernization and new equipment. The money will come from retained earnings. Westinghouse has more than $300 million in cash reserves.

• **Pipe firms merge**—Hooper Concrete Pipe Co. of Phoenix, Arizona has been acquired by the American Pipe & Construction Co. of South Gate, Calif. Hooper makes reinforced concrete pipe for irrigation and drainage systems, sewers, culverts, and water supply lines.

• **Bolted skyscraper**—A $32-million building loan has been arranged by Tishman Realty & Construction Co., Inc. with a group of New York banks for construction of a 38-story, air-conditioned office building at 666 Fifth Avenue, New York City, that will be the world's tallest rivetless skyscraper (ENR Jan. 26, '56, p. 28).

• **Cement firm has record sales**—Permanente Cement Co.'s 1955 sales and earnings were the highest in the company's history. Earnings after federal taxes for the fiscal year ending Jan. 31, 1956 were $6.3 million, up 24% over last year, while sales rose 9%.

• **Reactor experiment**—The Atomic Energy Commission has selected the proposal of the Babcock and Wilcox Co. to design, fabricate, and operate a liquid metal-fueled reactor. The selection is contingent on negotiation of an acceptable contract, AEC said.

• **Record road budget**—Florida's State Road Board has adopted a record budget of $165.8 million for the 1956-57 fiscal year.

• **Flood-control help**—Pennsylvania's Gov. Leader signed a bill permitting the state flood-control agency to build its projects through the General State Authority—the state's "borrow-and-build" construction unit.

• **Information, please**—Claiming that it has been unable to obtain certain construction cost information from them, the Federal Housing Administration has announced it will take over 12 housing corporations operating Sec. 608 projects built with FHA-insured mortgages. As the preferred stockholder in these corporate setups, the government agency can remove present directors, and appoint new ones.

• **New home for Turner**—New York City's new Socony Mobile Building, sixth largest commercial office building in the world, has a new tenant: Turner Construction Co., general contractor for the job.

• **Still optimistic**—With four months of put-in-place activity in the record books, AGC's President Frank J. Rooney last week renewed an earlier prediction that construction expenditures for the year will total $44.5 billion, up $2.5 billion over last year's record. Overall value of construction put-in-place in '56 could reach $60 billion for the first time, Rooney said, noting that as much as $15 billion may be spent this year just for maintenance and repair.

• **College building**—Construction wins all the way around from the growing U. S. interest in higher education. Last week, for example, the Eisenhower Administration asked Congress for another $100 million in lending authority to help colleges finance construction of student housing. With enrollment trends charted, at least in broad terms, experts say that student housing for colleges represents a $2-billion construction market in the next 10 years.

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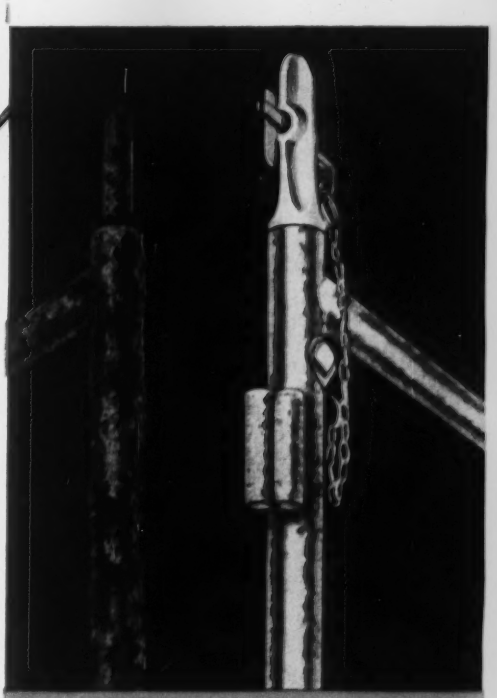

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The Wage-Hour Law

AFL-CIO asks Congress to extend its coverage

The AFL-CIO urged Congress last week to broaden the coverage of the Fair Labor Standards Act. Commonly known as the wage-hour law, the act's minimum wage and overtime provisions apply to many types of construction work.

The proposal was made by President George Meany in testimony before a Senate Labor Subcommittee headed by Paul Douglas (D) of Illinois.

Meany pointed out that extended coverage would have little effect on organized labor, but that it would materially benefit some 9,500,000 workers whose economic standards "need" the protection of the law. Nearly half this group, he noted, are in agriculture, construction and outside selling.

The wage-hour law was passed in 1938 to eliminate substandard working conditions and, except for its several specific exemptions, applies to individuals "engaged in commerce or in the production of goods for commerce."

In the application of its minimum wage ($1.00, effective March 1) and overtime (for work in excess of 40 hours) provisions to construction workers, the toughest problem has been that of defining what types of construction are in interstate commerce (ENR, Jan. 19, p. 112). For example: The law is generally invoked by movement of materials or equipment across state lines; by improvements to facilities of interstate commerce, such as airfields, bridges, post office buildings, rivers and harbors; by construction work on existing interstate factories and plants; and by new construction essentially a part of interstate commerce, such as roads, canals, locks and power lines. But where new construction doesn't expand or replace an existing facility of interstate commerce, the courts have usually held the law does not apply. Most common pitfalls have been the record keeping requirements and overtime provisions of the law.

Labor's present proposal would embrace a broader and more "realistic" definition of interstate commerce, as well as eliminate some of the existing exemptions, along what Meany described as "common sense" lines.

In its March issue of "Labor's Economic Review," the AFL-CIO "roughly estimated" an additional 1,400,000 construction workers would be covered by the present proposal.

Wage Talks Tense as Rates Climb Up

Wage negotiations with the building trades remained taut last week, with one of the darkest clouds gathering over Michigan.

A wave of strikes hit outstate Michigan, halting construction in 14 counties outside the metropolitan Detroit area, and there was little hope for settlement pending an outcome of negotiations in Detroit itself, where perhaps the carpenters union will prove to be the key.

Working since April 30 without a contract in a determined effort to avoid a metropolitan strike, the carpenters, who had hoped to get a two-year contract at 19½ and 12½ cents, tentatively agreed to a formula of 16.8 and 15.2. Meanwhile, a strike of Detroit iron workers was called, following refusal of a 17½-cent offer. But picket lines were not set up, other crafts remained at work, and Mackinac Bridge was unaffected.

Down in Texas, the Sabine area strike (ENR May 10, p. 121) continued, although it loked as if the AGC was ready to settle with the iron workers for a one-year contract at 17½ cents, affecting commercial construction only. And up in Cleveland, Ohio, an estimated 37,000 workers remained idle, as 17 of the building trades lowered their 25-cent demand to 17½ now, 2½ in November, and the same next year, under a two-year contract.

Elsewhere, scattered strikes of smaller proportions appeared in various areas, but the industry continued to tick off a host of settlements that generally kept faith with the trend toward longer-term contracts. Two-year periods remained the favorite, although bricklayers in Washington, D. C., for instance, signed up for three years at 15, 10 and 15, as did asphalt workers in Buffalo, N. Y., where raises for lower paid classifications are 12½, 12½ and 10.

In two-year contracts, new additions to basic rates generally hewed close to the 25-cent mark, with little uniformity in the allocation. Here are some samples: 15 and 10; 12½ and 12½.

According to the Bureau of Labor Statistics, wage boosts during the year's first quarter put wages for construction workers at an all-time high. Out of seven trades surveyed by BLS, average union scales for four topped $3.00; bricklayers were highest at $3.52 and building laborers lowest at $2.12. At the end of January, average hourly earnings on contract construction stood at $2.68, and average weekly earnings at $96.48.

Jobless Benefits

Mitchell rules against members of labor pools

The right of a state to deny unemployment compensation benefits to unemployed members of a labor pool who refuse work during a strike has been upheld by U.S. Secretary of Labor James P. Mitchell.

Mitchell has ruled that the California law, as interpreted by the State Supreme Court, substantially conforms to the federal law, with which state laws are integrated.

The question of conformity was raised when the California court denied jobless benefits to unemployed seamen—members of a rotational labor pool—who remained out of work during the 1948 West Coast maritime strike (ENR Aug. 18, 1955, p. 103). The California law denies benefits to those leaving their work because of a strike.

In holding that the seamen, through a hiring hall arrangement, had left their work because of a strike, Mitchell was following the recommendations of a three-man panel of legal authorities who had been appointed to study the issue. The panel concluded that the hiring hall arrangement gave the employes a "group attachment" to the struck jobs and that work offered to the claimants was their work and not "new work."

The ruling affords at least temporary assurance that statutory provisions like the California one won't jeopardize a state unemployment compensation system. In effect, it gives an unemployed member of a union hiring hall the choice between loss of jobless benefits and acceptance of strike-breaking work. And to the employer, it means that state funds won't be used to finance strikes.

Conscious of the heavy burden which compliance rulings place on the secretary, Mitchell is backing a bill introduced into Congress by Senator Knowland of California to permit federal court review of the secretary's decisions in conformity cases.

(*Labor continued on page 186*)

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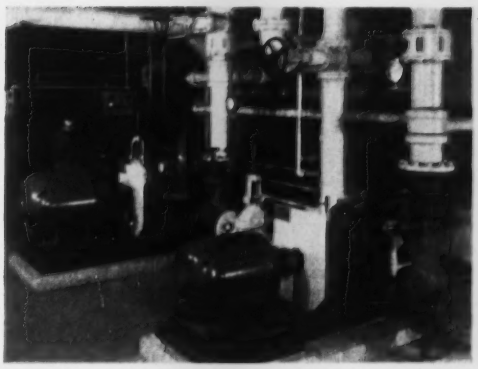

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Court Backs Lacey

Irregularities are found in contest for control of teamsters' N. Y. Council

The U.S. District Court for the Southern District of New York last week granted Martin T. Lacey a temporary injunction, preventing John J. O'Rourke from gaining control of the teamsters' Joint Council No. 16 in New York City.

Judge Palmieri's decision stemmed from the council's Feb. 14 election in which incumbent president Lacey was opposed by O'Rourke, who reportedly had the backing of international vice president James Hoffa, central figure in the now-dead but still controversial alliance between the teamsters and the International Longshoremen's Association.

Lacey, who won 192 undisputed votes to 181 for O'Rourke, claimed the election had been rigged. In dispute were 16 votes that were later declared valid by the international union and counted for O'Rourke. Seven of these had been cast by representatives of Local 445 (one of the 57 controlled by the council), four officers of which had been fraudently certified as eligible to vote. Uncounted, were 49 votes cast by representatives of seven new and hastily chartered locals never accredited by the council.

After hearing the evidence, the court concluded that the election was "tainted by illegality." It pointed to the unorthodox chartering of the seven locals, the international's efforts to provide them with voting rights, the "turbulent and dishonorable" record of Local 445, and the international's "hasty and arbitrary" action of validating the 16 challenged votes. The court viewed the unusual "intrusion" of the international as an "unwarranted interference with the election" and part of a "concerted action calculated improperly to affect the result." Any effort by Lacey to obtain redress within the union, it noted, would be futile.

ILO Takes a Look at Construction

Adequate housing for workers has become a problem of national importance to every country in the world. One of the essential causes, according to officials of the International Labor Organization, is that the homebuilding industry "has experienced less cost reduction as a result of the industrial revolution than perhaps has any other industry catering to the basic needs of workers."

This is one of the problems on the agenda of the Building, Civil Engineering and Public Works Committee of the International Labor Organization, meeting in Geneva, Switzerland, this week. The committee also will discuss general trends and developments, including safety standards, in the construction industry.

In two reports to be submitted to the committee, ILO officials note:

- One of the serious problems facing the industry in some countries today is the failure of building materials production to keep pace with the needs of the construction industry. Other problems include shortages of skilled workers, technicians and supervisory personnel.
- In countries such as Argentina and Italy, where "social charges" are a high percentage of daily wages, employers tend to extend the workday or workweek instead of taking on additional workers, since overtime does not affect the charges due from an employer.
- Except for Hong Kong and Malaya, where 56 hours is the normal workweek, Switzerland has the longest—50 hours is common—normal workweek for construction. In most European countries, including the United Kingdom, the construction workweek is appreciably higher than it is for manufacturing industries. In many countries, actual hours worked are increasing, instead of decreasing as they are in Canada, the Netherlands and the United States.
- In India, women constitute 25% of the construction work force.

Now cooperating with the United Nations, ILO, sometimes described as an international town meeting, was created in 1919—when the League of Nations was founded—to promote the cause of peace by helping to eliminate poverty, misery and injustice throughout the world. Making it a tri-partite agency, representatives of member nations are drawn from government, labor and industry. ILO activities—aimed largely at achievement of higher standards of living through increased production — embrace investigations and surveys, exchange of ideas and information, recommendations of international minimum standards, and technical assistance programs of various kinds. ILO decisions are not binding on member states, unless ratified and confirmed.

Among those attending the current ILO building committee session as a delegate appointed by President Eisenhower, is Howard McSpedon, president of the New York City Building and Construction Trades Council.

Labor Briefs . . .

- **Roving situs**—In a secondary boycott case involving a sheet metal workers local and American Enka Corp., the NLRB rules its doctrine concerning roving pickets doesn't apply and picketing is unlawful where the primary employer has a permanent place of business at which the union can effectively publicize its dispute.

- **Must open books**—The U.S. Supreme Court, upholding an NLRB decision against the Truitt Manufacturing Co. in Greensboro, N. C., ruled that an employer who contends in a collective bargaining session that he can't afford to pay higher wages fails to bargain "in good faith" unless he furnishes information to substantiate his claim.

- **Labor mergers**—The Trades & Labor Congress of Canada and the Canadian Congress of Labor have merged into the 1,018,000-member Canadian Labor Congress. And in the U.S., Montana has become the sixth state to complete its AFL-CIO merger.

- **Jurisdictional disputes**—The NLRB says neither its Lee case decision nor the building trades' December vote to make National Joint Board decisions binding on all affiliates prevents it from entering a dispute under Sec. 10 (k), where the employer, a subcontractor, has not agreed to the Joint Board procedure.

- **Tax deductions**—Internal Revenue Service has ruled that construction workers, who obtain temporary work away from home through their local union because of a shortage of local work, can deduct their traveling expenses for income tax purposes, if they continue to seek local work.

- **A strike against all**—The Utah Supreme Court has ruled that for the purposes of unemployment benefits a strike against two members of an employer association is a strike against all, rendering ineligible for jobless benefits employes laid off by un-struck employers, who were members of the association that was conducting negotiations involving a new master contract.

GOFF KIRBY READY MIX COMPANY DISPATCHES TRUCKS BY RADIO, SAVES MONEY ON HAULING

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CENTRAL HEATING AND
REFRIGERATION PLANT

Sealed proposals for the construction of the Central Heating and Refrigeration Plant in the Central Terminal Area at New York International Airport including paving and the furnishing and installation of utilities therefor, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 12, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112. Documents will be furnished upon deposit of $50.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $50.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 17, 1956

Bids: June 5, 1956

Contract LGA-220.006

ADVERTISEMENT

THE PORT OF NEW YORK AUTHORITY
LA GUARDIA AIRPORT
SECOND FEEDER FOR ASR-3 INSTALLATION AT RUNWAY 4-22

Sealed proposals for the furnishing and installation of the Second Feeder for ASR-3 Installation at Runway 4-22 will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 5, 1956, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1112, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, May 17, 1956

Bids: May 22, 1956

Contract 461

ENGINEERING NEWS-RECORD
EXPLORATORY SHAFT,
ACCESS ROADS, ETC.

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M. Eastern Daylight Saving Time (10:00 A.M., Eastern Standard Time) on Tuesday, May 22, 1956, for Contract 461, for the construction of a reinforced concrete exploratory shaft at the site of the proposed Cannonsville dam, the furnishing and installation of equipment for pumping ground water from the shaft, the pumping of ground water during the period of the contract, the construction of access roads, including two bridges, the excavation of shovel cuts and the construction of appurtenant structures. The shaft and access roads will be located in the Town of Deposit, Delaware county, New York.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1317, at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

U. S. Government

United States Department of Commerce, Bureau of Public Roads, May 7, 1956. SEALED BIDS will be received at the office of the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Building, Washington 25, D. C., until 2 p.m., e.d.t., June 21, 1956 for construction of Nicaragua Project 5-A, consisting of 10 bridges between Rivas and Penas Blancas on the Inter-American Highway in Nicaragua. Bidders will be limited to United States or Nicaragua firms with a satisfactory record of performance on construction in the United States of America or in the Republic of Nicaragua. The approximate quantities of the major items of work are: Unclassified Structural Excavation 6200 cu. yds., Class "A" Concrete 3120 cu. yds., Reinforcing Steel 451,000 lbs., Structural Steel 596,000 lbs. All material, equipment, and supplies used in the construction of this project must be products of the United States or of the Republic of Nicaragua, unless otherwise authorized. Bureau of Public Roads Specifications FP-41 will apply. Plans, Specifications and Proposal Forms are available upon request at the address given above, or at the Inter-American Highway District Office, Bureau of Public Roads, 516 Avenida Roosevelt, Managua, Nicaragua. C. D. Curtiss, Commissioner.

United States Department of Commerce, Bureau of Public Roads, May 10, 1956. SEALED BIDS will be received at the office of the Inter-American Highway Office, Bureau of Public Roads, Room 4009, General Services Administration Bldg., Washington 25, D. C. until 2 p.m., e.d.t., June 14, 1956 for the construction of approximately 21 miles of grading, drainage, and selected borrow base on the Inter-American Highway in Honduras between Jicaro Galan and the Nicaragua border. Bidders will be limited to United States or Honduras firms with a satisfactory record of performance on construction in the United States or in the Republic of Honduras. The approximate quantities of the major items of work are: Unclassified excavation 302,000 cu. meters, Unclassified borrow 224,000 cu. meters, Selected borrow base course 120,000 cu. meters, Class "A" concrete in box culverts, 1,360 cu. yards, Reinforcing steel in box culverts 155,000 lbs., Nestable bituminous coated corrugated metal pipe culvert 6250 feet (24" to 60"). All materials, equipment and supplies used in the construction of this project must be products of the United States or of Honduras unless otherwise authorized. Bureau of Public Roads Specifications FP-41 will apply. Plans, Specifications, and Proposal Forms are available upon request at the above address, or at the Inter-American Highway District Office, Bureau of Public Roads, Room 212, Banco Atlantida Bldg., Calle Colon, Tegucigalpa, Honduras, mailing address Apartado 165. C. D. Curtiss, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4691) will be received at Kennewick, Washington, until June 21, 1956, for furnishing labor and materials for Earthwork, Pipe Lines and Structures for Main Canal Laterals, Station 1325+00 to Station 2296+06.6, and Amon Pump Discharge Line and Laterals, Yakima Project, Washington Location near Kennewick, Washington. Principal items are 39,000 cu. yds. excavation and backfill of pipe trenches; 18,500 cu. yds. excavation for laterals; 77,700 lin. ft. furnishing and laying 8- to 15-inch diameter concrete irrigation pipe; 15,000 lin. ft. furnishing and laying 12- to 24-inch diameter concrete pressure pipe; and other work. The work is divided into two schedules. Completion time 240 days. For particulars, address Bureau of Reclamation, P. O. Box 516, Kennewick, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4695) will be received at McCook, Nebraska, until June 12, 1956, for furnishing labor and materials for Earthwork and Structures for Upper Meeker Canal, Subcanal, Laterals, and Drains, Frenchman-Cambridge Division, Missouri River Basin Project, Nebraska. Location near McCook, Nebraska. Principal items are 698,000 cu. yds. excavation; 233,000 cu. yds. compacting embankments; 3,480 cu. yds. concrete; 7,400 lin. ft. concrete pipe; various items—metal gates, steel pipe, and miscellaneous metalwork; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, P. O. Box 737, McCook, Nebraska; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4696) will be received at Ephrata, Washington, until June 14, 1956, for furnishing labor and materials for Earthwork, and Structures for EL.680 Wasteway Drainage System, East Low Canal Wasteways, Columbia Basin Project, Washington. Location near Othello, Washington. Principal items are 220,000 cu. yds. excavation; 117,300 cu. yds. compacting embankments and backfill; 7,100 cu. yds. riprap and rock backfill; 1,140 cu. yds. concrete in structures; and other work. Completion time 230 days. For particulars, address Bureau of Reclamation, P. O. Box 368, Ephrata, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: June 7, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 7th day of June 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany, N. Y.						
Albany	Ch. 103/11/45 } #2 Ch. 52/10/55 }	County Assistant's Office and Garage at Voorheesville	....	Asp. Conc., Opt., Grading, Paving & Misc. Work	$1,800 Plans $10	$33,000
Saratoga	Ch. 103/11/45 } #3 Ch. 52/10/55 }	County Assistant's Office and Garage at Saratoga	....	Asp. Conc., Opt., Grading, Paving & Misc. Work	$3,300 Plans $10	59,000
Albany	R.C. 56-32	Loudon Pt. 2, S.H. 119 Loudon-Crescent, S.H. 5555 Loudon-Crescent, Pt. 2, S.H. 5614	6.43	Asp. Conc., Opt.	$13,500 Plans $10	251,000
Greene & Ulster	FASSH 56-10 FARC 56-82	Phoenicia-Stony Clove, Pt. 1, Hwy. No. 214-2-1 Phoenicia-Kaaterskill Junction, S.H. 9048 Project S-937(4)	3.98	Bit. Mac. Pen. Meth., Ty. 1; 2 R.C. Closed Box Brs. 22.6' and 28.3'; Comp. I-Beam Br. 42'	$45,000 Plans $25	815,000
Rensselaer	R.C. 56-33	Cropseyville-Grafton, S.H. 5222 Grafton-Petersburg, S.H. 5478	3.93	Asp. Conc., Opt.	$7,000 Plans $10	135,000
DISTRICT No. 2, Lacy Ketchum, District Engineer, 106 No. Genesee St., Utica, N. Y.						
Madison & Oneida	FASH 56-2 FARC 56-34	Oneida-South Bay, Pt. 1, S.H. 1110 City of Oneida: North-South Arterial Connection Project US-458(1)	1.04	9" Cem. Conc. Pavt. 24' Wide Comp. I-Beam Br. 161'	$25,000 Plans $15	450,000
Oneida	FAC 56-5 FAGC 56-6	City of Utica: North-South Arterial Route (Oriskany Street West-Riverside Drive) Project U-UG-752(6)	1.20 (0.55) (Acc.)	9" Cem. Conc. Pavt. Var. Wide=0.51 Mi.; Asp. Conc., Ty. 1A=1.15 Mi.; Misc. Work=0.06 Mi.; 2 RR. Sep. Comp. I-Beams 493.2' and 556.9'; 1 Hy. Sep. Comp. I-Beam 240.3'; 1 Br. Comp. I-Beam & Plate Girder 298'	$250,000 Plans $50	4,527,000
DISTRICT No. 3, William Robinson, District Engineer, Weigh Lock Building, Syracuse, N. Y.						
Tompkins	R.C. 56-29	Taughannock State Park-Ithaca, S.H. 1921	5.25	Asp. Conc., Type 1A	$13,000 Plans $10	237,000
Tompkins	R.C. 56-30	Ithaca-Danby, Pts. 1 & 2, S.H. 5043-5122	5.83	Asp. Conc., Type 1A	$12,000 Plans $10	233,000
DISTRICT No. 4, B. F. Perry; Acting District Engineer, Barge Canal Terminal, Rochester, N. Y.						
Monroe	FAC 56-3	City of Rochester: Inner Loop (South Ave. to George St.) Project U-UG-231(9)	0.54 (2.04) (Acc.)	Asp. Conc., Type 2A; 3 Hy. Seps. Comp. I-Beams; 101.5', 119.9' and 131.5'; 1 RR Sep. Comp. I-Beam 174.8'	$160,000 Plans $100	2,939,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court St., Buffalo, N. Y.						
Erie	R.C. 56-21	Depew Village, S.H. 916 Genesee Street, Pt. 1, S.H. 1212	4.43	Asp. Conc., Type 2A	$20,000 Plans $10	361,000
Erie	R.C. 56-35	Main Street, Pt. 1, S.H. 69	3.13	Asp. Conc., Type 2A	$19,000 Plans $10	354,000
Erie	R.C. 56-36	Sheridan Drive, S.H. 9216	6.83	Asp. Conc., Type 2A=6.80 Mi. Misc. Work=0.03 Mi.	$30,000 Plans $10	546,000
DISTRICT No. 6, J. H. Thomas, District Engineer, 30 W. Main St., Hornell, N. Y.						
Steuben	FASS 56-4	Webbs Crossing Road, CR #66 Project S-447(1)	0.26	Asp. Conc., Opt. Comp. I-Beam Br. 115'	$8,000 Plans $10	152,000
DISTRICT No. 7, W. C. Bassette, Acting District Engineer, 444 Van Duzee Street, Watertown, N. Y.						
Jefferson	FAC 56-4	City of Watertown: Bradley-Street Project U-745(3)	0.86	Asp. Conc., Opt.=0.84 Mi.; Misc. Work=0.02 Mi.; R.C. Twin Box Br. 30'	$19,000 Plans $15	353,000
DISTRICT No. 8, Kurt G. Rauer, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Dutchess	TSP RC56-3	Taconic State Parkway, Sect. 3 and 4 (Incl. Shenandoah Gas Sta. Area)	3.49	Asp. Conc., Opt.	$4,500 Plans $10	80,000
Rockland	R.C. 56-27	Tompkins Cove-West Haverstraw, S.H. 8049	0.18	Cem. Conc. Sidewalks and Curbs	$550 Plans $10	10,000
Orange & Sullivan	FARC 56-80	Bloomingburg-Monticello, Pt. 1, S.H. 5510-5510A Middletown-Bloomingburg, S.H. 5210-5210A-5210B Goshen-Fair Oaks, Pt. 3, S.H. 47-11 Bloomingburg-Bullville, S.H. 8166 Project F-495(6)	6.63 (4.44) (Acc.)	9" Cem. Conc. Pavt. 2 @ 25' Wide=7.99 Mi.; Asp. Conc., Opt.=2.67 Mi.; Fdtn. Crse. Grav.=0.25 Mi.; Treated Gravel=0.08 Mi.; Misc. Work=0.08 Mi.; 5 Hy. Seps. Comp. I-Beams 175.1', 267.5', 127.9', 114.6' and 227'; 1 Br. Comp. I-Beam 158'	$400,000 Plans $100	7,371,000
District No. 9, F. J. Weber, Acting District Engineer, 71 Frederick Street, Binghamton, N. Y.						
Broome	FASS 56-3	Deposit-Oquago Lake Project S-269(1)	0.07	Asp. Conc., Opt. Comp. I-Beam Br. 109'	$7,000 Plans $10	131,000
DISTRICT No. 10, M. E. Goel, District Engineer, 325 W. Main Street, Babylon, L. I., N. Y.						
Bronx	FAMDE 56-1	Major Deegan Expressway and Extension, Cont. 18 Project U-1082(22)	7.33	Landscaping and Misc. Work	$18,000 Plans $15	324,000
Bronx	FANETC 56-3	New York State Thruway-New England Section, Cont. #4 (Hutchinson River Pkwy.-Westchester Ave.); Bronx-Pelham Pkwy. and Access Roads Project IN-1068(11)	0.91 (3.59) (Acc.)	9" Cem. Conc. Pavt. 2 @ 36' & Var. Wide=2.94 Mi.; Misc. Work=1.56 Mi.; Hy. Sep. Comp. I-Beam 205'; RR. Sep. Plate Girder 346.1'	$250,000 Plans $100	4,512,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Read the Official Proposal Columns of
ENGINEERING NEWS-RECORD
This Week and Every Week

OFFICIAL PROPOSALS

Bids: June 5, 1956

The Richmond-Petersburg Turnpike Authority Richmond, Va.

NOTICE IS HEREBY GIVEN that Sealed Bids will be received by The Richmond-Petersburg Turnpike Authority for:

CONTRACT NO. B-1-SUB, SECTION B Construction of the Richmond-Petersburg Turnpike, Contract B-1-Sub, Section B, Substructure-South for the James River Bridge in the City of Richmond.

The principal items of work are:

Estimated

20,000 Cu.Yds.	Borrow Excavation
4,900 Cu.Yds.	Unclassified Foundation Excavation
1,000 Cu.Yds.	Porous Fill
1,550,000 Lbs.	Reinforcing Steel
4,600 Cu.Yds.	Class X Concrete, Footings for Piers, Abutments and Wingwalls
7,400 Cu.Yds.	Class A Concrete in Piers, Abutments and Wingwalls above Footings
8,300 Cu.Yds.	Class X Concrete in Tremie Seals
11,000 Lin. Ft.	Steel Bearing Piles (Piles Furnished by Others)

Bids for the above described work will be received at the office of The Richmond-Petersburg Turnpike Authority, 1015 East Main Street or by mail at P.O. Box 1-R, Richmond 2, Va., until 10:00 A.M. (Est), 11:00 A.M. (DST), Tuesday, June 5, 1956, and will be publicly opened and read aloud immediately thereafter in the Hunt Room of the Hotel Raleigh, 9th and Bank Streets, Richmond, Va.

Bids will be received only from those bidders who are registered in the State of Virginia and who are prequalified with The Richmond-Petersburg Turnpike Authority. Bidders prequalified with The Richmond-Petersburg Turnpike Authority must submit a revised "Contractor's Prequalification Record and Statements" with their bids unless there has been no substantial change, or if there has been a lapse of less than six (6) months since last submission of the prequalification form or as otherwise may be required by the Authority. Prequalified bidders not required to submit a revised prequalification form as specified herein, shall so certify under oath, on the form furnished by the Authority, and such certificate must accompany their bids.

Plans, Specifications, Proposal, and form of Proposal Bond, Contract and Contract Bond are on file at the offices of The Richmond-Petersburg Turnpike Authority, 1015 East Main Street, Richmond, Va., and at the offices of the Engineers, Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York, New York, where they may be inspected by prospective bidders during office hours.

Plans and Specifications (including Proposal Form, Proposal Bond Form, Contract and Contract Bond Form, Special Provisions) will be furnished to registered, prequalified contractors for $10.00 per set. Va. Dept. of Highways, Roads and Bridge Specifications, dated April 1, 1954, may be purchased for $1.00 per copy each. No refund will be made for any of the above stated charges.

Proposal Guaranties consisting of either a certified or cashier's check in the amount of not less than 2½% of the total amount bid made payable to The Richmond-Petersburg Turnpike Authority together with a satisfactory Proposal Bond in at least 20% of the total amount bid, specifying The Richmond-Petersburg Turnpike Authority as the Obligee must accompany each bid. All proposal guaranties will be returned immediately after the opening of bids except those of the three lowest bidders.

All work shall be done in accordance with the Plans and the Virginia Dept. of Highways, Road and Bridge Specifications dated April 1, 1954, as amended by The Turnpike Supplemental Specifications dated March 1, 1956; both as amended by the Special Provisions.

The Authority reserves the right to reject any or all bids, submitted in response to this advertisement, and to waive technicalities as it may deem best for the interest of the Authority.

NOTE: Plans and Specifications will not be mailed prior to the receipt of payment of cost shown in this Advertisement.

THE RICHMOND-PETERSBURG TURNPIKE AUTHORITY
S. H. Meem, Jr.
(Assistant General Manager)

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (5)

POSITIONS VACANT

Mechanical and Piping Erection Superintendent for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1719, Engineering News-Record.

Civil Engineer. Prefer 5 to 10 years experience in design and details of sewer and water systems, drainage and grading, street work, municipal engineering. For Midwest consulting firm. Salary $6,000-$8,000 plus overtime and benefits. Sverdrup & Parcel, Inc., Engineers-Architects, 915 Olive, St. Louis 1, Mo.

Soils Engineer. Soils work in connection with foundations of bridges, buildings, highway and miscellaneous structures, also testing and control of placement of earth fills for highway and railway project. Prefer associated ability in civil or structural design engineering. For Midwest consulting firm. Salary $6,000-$8,000 plus overtime and benefits. Sverdrup & Parcel, Inc., Engineers-Architects, 915 Olive, St. Louis 1, Mo.

Engineers experienced in design and supervision of construction to work as resident engineers or prepare plans for water and sewer systems. State experience, age, salary required, when can report, and give references. Reply P-9290, Engineering News-Record.

Bridge Designers — Highway Department — Mountain West. Permanent positions in new office building, 5 day week. Starting $5100 up. Paid vacations, sick leave. Retirement program. Hospitalization optional. Employee rating system with periodic advancement based on merit. Opportunity to work on all phases of bridge design from hydraulics to completed structure. Include summary of education, experience, personal history, references. Write: Personnel, Wyoming Highway Department, Box 931, Cheyenne, Wyoming.

Mechanical and Piping Detailer for sewage treatment and filtration plant construction. Midwestern contracting firm specializing in this work has permanent position open. Please give experience and full details in reply. Replies will be held confidential if requested. P-1715, Engineering News-Record.

POSITIONS VACANT

100 Civil Engineer Vacancies—The Michigan Civil Service Commission is currently recruiting to fill a large number of positions in the State Highway Department created by an expansion in the road construction program from $70 million in 1955 to $150 million in 1956. A comprehensive Engineer Trainee Program is offered to graduates of accredited engineering colleges. The program continues for 12 to 18 months including seven week assignments in each of the following: Bridge Construction, bridge design, road construction, road design, road surveys, maintenance, planning and traffic and testing and research (Soils). One hundred and ninety-one persons have entered this program in the last seven years. One hundred and thirty-two remain. The figures speak for themselves. Job opportunity, promotion, 40 hour work week, security, social security, state pension plan, vacation, sick leave and many other benefits generally available only under a progressive civil service system are yours when you work for the Michigan State Highway Department. Salary for the Engineer Trainee Program starts at $4600 plus $20 weekly expense allowance while on most training assignments with 6 months increases to $5200 in 18 months. First promotion brings salary range with maximum of $6800. Next promotion to project engineer carries salary at maximum of $8150. Write for application for Engineer Trainee I to Michigan Civil Service, Recruitment and Placement, Lansing 13, Michigan.

General Superintendent—Who is now superintendent engineer and wants to take next step up with growing N. J. organization. P-1579, Engineering News-Record.

Office Engineer—Civil, 2 years construction experience, estimating, checking details, job coordinator, expediting, etc. North New Jersey. P-1576, Engineering News-Record.

Engineers one or two years experience in structural design or recent graduates. Consulting engineers office Newark, N. J. Give education, experience and salary. P-8890, Engineering News-Record.

Wanted—Salesman, heavy construction equipment, Los Angeles distributor leading exclusive lines—protected geographical area—salary, commission, car and expenses. Reply P-1732, Engineering News-Record, 68 Post St., Los Angeles, Calif.

Sales Engineers to introduce outstanding product in sanitary and drainage fields. Young, aggressive, well-financed company. Salary open. Location: Gulf Coast. P-1689, Engineering News-Record.

POSITIONS VACANT

Civil Engineer, preference given to man with Illinois, County, Township or Federal Aid Secondary, survey, design or construction experience or equal. Position permanent, good working and living conditions. Give education, experience and salary expected. Hancock County Highway Department, Carthage, Illinois.

Superintendent—with engineering background —to become associated with a growing excavating-paving and flood control contractor in Western New York. As field superintendent the right man can build his own future. Sheridan Construction Corp. 3580 Sheridan Drive Buffalo 21, New York.

Assistant City Engineer: City of Owosso, Mich. Must be a graduate civil engineer or man with considerable experience in surveying and drafting, with some design knowledge for general municipal engineering. Submit complete resume with salary requirements and earliest date available in first letter to City Engineer, Owosso, Michigan.

Reinforcing Steel Detailers for established firm in New York City and other desirable Eastern locations. Send resume of experience and salary requirements. Replies confidential. P-1625, Engineering News-Record.

College Instructor—Young engineering graduate. Some industrial experience desirable. Opportunity to work on advanced degree. Write: Head, Department of Engineering Drawing, Iowa State College, Amiss, Iowa.

Graduate Engineer to become City Engineer in a community of 22,000 population, which is a suburb of the City of Detroit. Engineer will be in charge of the Department and have control of all public works within the city. Need not be registered. Salary open, but in neighborhood $6,500.00 and $7,000.00. Applications to the City Manager, City Hall, 3322 Coolidge Highway, Berkley, Michigan.

Civil Engineer, Bridge Designers, draftsmen graduate engineers capable of becoming job captains and project engineers. Location Detroit area. Long Program. P-1731, Engineering News-Record.

Designers & Draftsmen experienced in all types of municipal work. Send resume, availability, and salary requirements to City Engineer, Waco, Texas.

Estimator a minimum of 5 years experience in quantity take-offs and pricing of industrial and commercial buildings. William J. Moran Company, 1011 S. Fremont Cumberland 3-2717 Alhambra, California.

(Continued on opposite page)

ASSOCIATION EXECUTIVE

Experience as engineer or industry representative highway construction industry and contact with highway officials desirable. Duties involve direction of large Division, fifty year old national association in Washington, D. C. Good pay, liberal retirement and other benefits. State education, age, business experience, salary expected.

P-1726, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT
(Continued from opposite page)

Architectural or engr. draftsman, experienced. Monroe, Licht & Higgins, Arch.-Engr., 827 E. Yandell Blvd., El Paso, Texas.

EMPLOYMENT SERVICE

Salaried personnel, $5,000-$30,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L. P. O. Box 674, Manchester, Vermont.

POSITIONS WANTED

Chief Structural Engineer buildings—single and multiastory foundations, civil and waterfront work location New York City. PW-1425, Engineering News-Record.

Civil Eng. Reg. 28 yrs. old with experience in const. of roads, sewers, foundations, earth work, steel and masonry work. Now employed as Asst. project mgr. on large const. job. Wants job with contractor as supt. or assistant. PW-1604, Engineering News-Record.

Civil Engineer, 28, reg. PE several Eastern States, exp. in bridge desn., prestressed conc. Seeks respons. design or admin. posn. with consultants or contractor. PW-1686, Engineering News-Record.

Building estimator, 29, BSCE, married. 3 years estimating experience, 3 years diversified field experience. Bid to completion. Desires responsible position with general contractor. PW-1703, Engineering News-Record.

Heavy Const Supt desires work far West. Piling, cofferdams, earth moving, underpinning steel & concrete const. PW-1722, Engineering News-Record.

Surveyor, Lic. Ill. age 28, desires position with consultant or surveyor in midwest. 7 years experience, party chief, field engineer. PW-1723, Engineering News-Record.

Construction Executive-41-project manager, gen. supt., estimator, Reg. C.E., 20 year proven record. Special qualifications in organization and planning difficult work. Available for association with gen. contractor, Southeast. Opportunity and $14,000. PW-1742, Engineering News-Record.

Hydraulic Engineer—BSCE—Wide and extensive experience in the design of earth dams, irrigation, drainage and flood control works. Available for U. S. or overseas; fair knowledge of Spanish. PW-1743, Engineering News-Record.

Sewer and Water Utilities Manager and project engineer. Registered Professional Engineer. Wide experience in supervising design, construction and operations of sewer and water utilities and other projects. Also sales and estimating. PW-1744, Engineering News-Record.

Walter Barleigh Freeman now of Tilghman, Md wants employment. C.E. License 13561 N. Y. 5/7/35. A splendid experience of many years in responsible charge, engineering, job planning, estimating and general supervision on job. Together with a very practical knowledge of the trades, cut put and machine use. Heavy construction and large building. 4 languages location immaterial.

SELLING OPPORTUNITIES WANTED

Engineer, Technologist, retired, would represent, Long Island Manufacturers, dealers, engineers. RA-1474, Engineering News-Record.

Manufacturer's Rep. to roadway and building contractors in North Carolina seeks additional lines. RA-1724, Engineering News-Record.

Sales Engineer, Detroit area. Wide experience and contacts with industrial construction. SA-1741, Engineering News-Record.

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

Positions Vacant | **Civil Service Opportunities . . .** | **Employment Agencies**
Positions Wanted | **Selling Opportunities Wanted** | **Employment Services**
Part Time Work | **Selling Opportunities Offered** | **Labor Bureaus**

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Send NEW ADS and inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y.

CIVIL ENGINEERS

(Ages 25-32)

Career opportunities for civil engineers in the expanding organization of a major U. S. integrated oil company operating in South America. Openings available in positions requiring 4½ to 6 years' experience in (1) highway engineering and maintenance, asphalt mixes and subgrade design; (2) structural design, including foundations for large structures and a background in soil mechanics; (3) concrete studies and research; (4) general civil engineering functions relating to utilities, buildings, bridges, harbor bulkheads, tanker piers, etc. Salary, including bonus, $14,000. Liberal employee benefits and home vacations with travel expenses. Send complete resume of work experience and personal data. Interviews will be arranged for qualified candidates. All replies confidential.

Box 1221—Dept. K-77—New York 1, N. Y.

HIGHWAY ENGINEERS for work in New Jersey and New York

Designers, draftsmen, chiefs of party, specification writers — submit complete resume stating education, experience, salary desired and date of availability to

P-1603 Engineering News-Record
330 W. 42 St. New York 36, N. Y.

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

P-8324, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, powerplants, river control works and highways. Permanent positions. Liberal employe benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING COMPANY
400 W. Madison St.
Chicago 6, Ill.

INSPECTOR ENGINEER

Graduate Mechanical Engineer with minimum 3 years' experience in work involving thorough knowledge of the materials and equipment used for oil producing, refining and supporting facilities. Knowledge A.P.I. and A.S.M.E. and other production codes required. For New York office, however, job requires extensive travel throughout the U. S. to inspect and approve purchased equipment and materials.

Salary commensurate with education and work experience. Liberal benefit program. Write outlining personal history and work experience.

Recruiting Supervisor, Box 114

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

STRUCTURAL DRAFTSMEN

A national major steel fabricating firm rapidly expanding its West Coast division offers attractive, permanent positions to experienced structural detailers and checkers.

LIBERAL EMPLOYEE BENEFITS

Please write giving all pertinent information regarding age, qualifications, references and salary requirements, to:

Mr. C. C. Buckley
PITTSBURGH-DES MOINES STEEL CO.
P. O. Box 1112 **Fresno, California**

BECHTEL

ENGINEERS DESIGNERS

MECHANICAL—

Design experience in one or more of the following fields:

Refinery and Chemical Plant Processes, Steam Power Plants, Hydro-Electric Projects, Instrumentation and Controls, Materials Handling Equipment, Metallurgical Process Equipment such as metallurgical furnaces, kilns, crushers, or related heavy machinery, heating and ventilating, or industrial plant layout.

ELECTRICAL—

Responsible design experience on panel boards, industrial controls, power distribution or lighting.

STRUCTURAL—

Design or detailing experience in structural steel and/or re-inforced concrete for Petroleum Refineries, Steam Power, Hydro Electric, or industrial projects.

PIPING—

Designers with drafting and layout on high temperature high pressure piping.

Immediate openings in our

SAN FRANCISCO
and
LOS ANGELES OFFICES

LIBERAL RELOCATION ALLOWANCES

Send Resume:

5 West 45th St. New York 17, N. Y.
220 Bush St., San Francisco, Calif.

Confidential interview can also be obtained at: Scanlon Building, Houston, Texas, or Roosevelt Building, Los Angeles, Calif.

BECHTEL CORPORATION

Engineers - Constructors

ENGINEERS
Designers Detailers Draftsmen
for work on
Bridges, Expressways, Turnpikes

PERMANENT POSITIONS DEPENDING ON EXPERIENCE AND ABILITY
PAID VACATION, SICK LEAVE HOSPITALIZATION, LIFE INSURANCE
INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

Howard, Needles, Tammen & Bergendoff
1805 GRAND AVE. KANSAS CITY 8, MO.

DESIGN ENGINEERS

You can fill a desirable *permanent* position in McKee's enlarged Refinery, Metals or Industrial Divisions. Our expansion program gives you excellent opportunity for advancement in one of the world's largest engineering firms.

World-wide McKee operation offers you wide choice in the design of Petroleum Refineries, Chemical Plants, Blast Furnaces, Steel Plants, Sintering Plants and Industrial Plants in the following fields:

PIPING LAYOUT, STRUCTURAL STEEL, CONCRETE, PROCESS HEATERS, EQUIPMENT SPECIFICATIONS, LAYOUT AND PROCESS DESIGN. ALSO PIPING AND ELECTRICAL DRAFTSMEN.

You get top compensation, the security of a life-long pension, paid vacations, benefits of insurance, hospitalization, sick-leave pay and training program.

You'll work with modern equipment in large air-conditioned quarters. Free parking on premises.

Cleveland has attractive residential areas, excellent schools and colleges for you and your family. McKee makes generous transportation and moving allowances.

Write for an interview giving education and experience. No age limitations. All letters kept strictly confidential. Write today to:

Edward A. Kolner

ARTHUR G. McKEE & COMPANY
2300 Chester Avenue
Cleveland 1, Ohio

ENGINEERS DESIGNERS DRAFTSMEN

Permanent openings in our St. Louis and San Francisco offices for qualified personnel experienced in design of structural steel and reinforced concrete for work on

BRIDGES & BUILDINGS
HYDROELECTRIC PROJECTS
INDUSTRIAL FACILITIES

Openings also available for mechanical and electrical designers and draftsmen for work on power plants, test facilities, large electrical installations and general industrial projects. Several recent graduate engineers will be added in all categories.

We desire men who want long range employment with ample opportunity for professional development and advancement. Excellent Employee Benefits & Retirement Plan, generous annual leave and sick leave, Blue Cross, paid holidays.

Please write fully to

SVERDRUP & PARCEL, INC.
Engineers — Architects
915 Olive Street St. Louis 1, Mo.

AUTOMOTIVE ENGINEER

Graduate M.E. with minimum 5 years' experience involving design, selection or preparation of specifications for the construction and use of heavy, medium and light off-road automotive equipment. For work in Company's Equipment Engineering Department. Will prepare specifications for manufacture, economic and engineering analysis for selection and guidance for tests and inspection of purchased equipment. Salary commensurate with qualifications.

Write outlining personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 132

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, NEW YORK

ENGINEERS—DESIGNERS—DETAILERS
for work on
BRIDGES AND HIGHWAYS

Permanent Positions for Experienced Men and New Graduates in our CINCINNATI, OHIO, and LANSING, MICHIGAN, Offices.

Paid vacations and holidays, insurance and retirement plan.

Please give detailed personal and experience record, references and salary expected in application letter.

Hazelet & Erdal, Consulting Engineers
Dixie Terminal Bldg.
Cincinnati 2, Ohio

WANTED

CIVIL ENGINEER

PUBLIC WORKS DEPARTMENT, ENGINEERING DIVISION, TOWN OF NATICK

Applicants must be graduate C.E. or have 2 years Engineering College or equivalent and experience in Field Engineering, construction, inspection, and surveying in connection with Highways, Water and Sewer Systems. Administration experience in Engineering Office desirable. Salary Range $4830 to $5310. Vacations. Insurance (life plan.) Retirement System. Applications will be received in the Office of the Director of Public Works, Mr. Walter F. Burdick, 44 Middlesex Avenue, Natick, Massachusetts.

WANTED

Structural Steel Detailers and Checkers for Expanding Structural Steel Fabricating Company in Eastern Ohio.

Good rate plus overtime for experienced men. Send experience history, references, availability and salary wanted in first letter.

Reply to:

P-1628, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS
HIGHWAYS AND BRIDGES

Designers
Draftsmen

OPENINGS At
Rochester, Penna., Harrisburg, Penna., College Park, Md.

ARCHITECTS
Architectural Draftsmen

OPENINGS At
Rochester, Penna.

Send Resume Including Education, Experience, Salary Requirements and Availability TO:

Richard L. Shaw, *Personnel Director*

Michael Baker, Jr., Inc.
Consulting Engineers
Baker Building Rochester, Penna.

WANTED—EXPERIENCED
Specifications writer

Preferably familiar with Architectural Engineering
Assist in General Co-ordination
Work in our Boston Office

Metcalf & Eddy **Boston, Mass.**
Statler Office Building

ENGINEERS
PROJECT & SUPERVISING

5-10 years experience in oil, refinery or chemical plants

Worldwide Engineering & Construction org'n in N. Y. City

EXCELLENT OPPORTUNITIES AND SALARY

Send resume stating education, experience and salary requirements. All replies confidential.

ER, 1061, 221 W 41 St. NYC, NY

STRUCTURAL DETAILERS

Permanent positions for structural draftsmen having at least three years experience, with structural steel fabricators, on bridge and building work. Modern air-conditioned office with all employee benefits.

ST. JOSEPH STRUCTURAL STEEL CO.
Box 68, Station A St. Joseph, Mo.

ENGINEER or ARCHITECT

Excellent opportunity for an experienced engineer or architect to serve as building inspector and to supervise electrical and plumbing inspectors. Permanent, Civil Service status, vacation, sick benefits, pension, etc.
Salary—open.

Apply to the CITY MANAGER
Iowa City, Iowa.

Caisson Sinking Foremen

Experienced in sinking caissons. Open dredging method. Rappahannock River Bridge.

DIAMOND CONSTRUCTION CO.
SALUDA, VIRGINIA

WANTED
MASTER MECHANIC

For Chicago contractor. Complete line of equipment. Must be proficient in shop management, field set-ups, and records keeping.

P-1635, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

HIGHWAY ENGINEERS

OPPORTUNITIES IN ST. LOUIS FOR

Designers
Detailers
Draftsmen
Soils & Drainage Specialists

Location & Construction Engineer for Foreign Service

PERMANENT EMPLOYMENT FOR QUALIFIED MEN ON EXPRESSWAYS, FREEWAYS AND TURNPIKES

VOLUNTARY RETIREMENT PLAN AND OTHER BENEFITS

Send Full Resume to

SVERDRUP & PARCEL ENGINEERING CO.

1134 LOCUST ST. ST. LOUIS 1, MO.

STRUCTURAL ENGINEER

Opportunity with a structural steel fabricator for a structural engineer having five (5) to ten (10) years (or more) structural design, detailing and estimating experience on all types structural steel structures.

Send experience record, references, and statement of availability. Salary open and commensurate with experience.

PITTSBURGH BRIDGE & IRON WORKS
1601 Union Bank Building
Pittsburgh 22, Pennsylvania

INDUSTRIAL ENGINEERS

College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

MECHANICAL ENGINEERS

(Ages 25–32)

Career opportunities with a major integrated U. S. oil company operating in South America. Position vacancies exist in an expanding organization for graduate mechanical engineers with 4½ to 6 years of experience. Activities include the design, installation and modification of compressors, turbines, hoists, pressure vessels, automatic controls, centrifugal and direct displacement pumps, etc. Salary, including bonus, $14,000. Liberal employee benefits and home vacations with travel expenses. Send complete resume of work experience and personal data. Interviews will be arranged for qualified candidates. Replies held in strict confidence.

Box 1221
Dept. T-77, New York 1, N. Y.

(Additional Employment Advertising on following page)

Construction ENGINEERS

FOREIGN EMPLOYMENT

Graduate Electrical, Mechanical, Civil or Chemical Engineers with minimum 10 years' experience supervising construction of industrial buildings, oil processing and oil handling facilities. Engineering degree essential. To assist in constructing expanding company facilities of major foreign operating oil company located in Saudi Arabia. Generous salary plus living allowance: liberal all-inclusive benefit program.

Write giving full particulars regarding personal history and work experience.

Recruiting Supervisor, Box 146

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
NEW YORK 22, N. Y.

OVERSEAS PROJECT

Immediate openings for

. . . CHIEF ENGINEER
. . . ARCHITECTS
. . . DRAFTSMEN
. . . BUILDING INSPECTORS
. . . PAVING INSPECTORS
. . . COMPUTERS

Rush complete resume to
OVERSEAS PROJECT

P-1712, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ASSISTANT CHIEF ENGINEER

Maryland Public Service Commission. Must have degree and 5 years' experience, 2 years as supervisor. Write Comm. of Personnel, 31 Light St., Balto. 2, Md.

ESTIMATORS

Permanent responsible positions in Chicago office of large, established organization designing and erecting chemical plants. Must be experienced in either structural or in equipment and piping erection costs. Air-conditioned office with all benefits. Send confidential resume to:

BLAW-KNOX CO.
180 N. Wabash Ave. Chicago 1, Ill.

ENGINEERS—DESIGNERS—DRAFTSMEN

Expressway—Toll Road—Structural

Consulting Firm in active general practice now staffing for design-construction phases toll road and general assignments; receiving applications from experienced expressway designers; highway designers and draftsmen; structural and staff engineers. Immediate assignments Chicago Area. Confidential resume to

HOMER L. CHASTAIN & ASSOCIATES
1860 Shermer Ave. Northbrook, Illinois

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES — EQUIPMENT - USED or RESALE

Engineers—Foremen—Office Men

Learn latest methods to organize and run work. Prepare for the top jobs.
Send post card for details.

GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

BUSINESS OPPORTUNITY

Capital Available former contractor desires to connect with young aggressive construction outfit wishing to expand. Advise type and scope of present jobs. Location unimportant. BO-1536, Engineering News-Record.

FOR SALE

For Sale New Invention United States patent pending 424402 small device barb wire dispensor with advantages. No reasonable offer refused or royalty base. Brochure mailed upon request. FS-1752, Engineering News-Record.

WORK WANTED

Professional Engineers offer design and detailing services for Industrial, commercial and public buildings and bridges on contract or hourly basis. WW-1721, Engineering News-Record.

Recently formed partnership of Architects and Engineers wishes to associate with organization to do some of its overload work. Principals are registered and are available for work East Coast and Mid-West. WW-1711, Engineering News-Record.

WANTED

Anything within reason that is wanted in the field of Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

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ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Early third year.
WILSON *Engineering Corp*
Home Office: HARVARD SQ. CAMBRIDGE MASS.

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SIMPLICITY A8-50. Completely rebuilt. 2500 # pugmill, 8 x 10 double shell dryer, gas fired. GMC 671 diesel power. Considerable quantity new and used parts included. $26,500 f.o.b. cars Wichita.

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For Models 2000, 3000, 3500 & 3900. Steel Erection Type—Also—Dragline Booms with Fairleads & Lagging.

All Guaranteed Like New

ANDERSON EQUIPMENT COMPANY
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

FOR SALE

Lima 802, 50 ton, 2 yd. crane, 1948 cat. D-17,000 diesel, 130' boom.
Lorain 820 2 yd. diesel shovel.
Lorain 50, 1 yd. diesel shovel.
Lorain MC-414 ¾ yd. truck crane
P. & H 255A ¾ yd. shovel, sacrifice $4500.00.
Caterpillar D-7 and D-2 bulldozers.
Ingersoll-Rand 500 cu.ft. diesel air compressor—good condition, sacrifice, $3000.00.

RAE STEEL CORPORATION
15 Park Row New York 38, N. Y.
WOrth 4-5199

SAND PUMP - FOR SALE

10" Amer. Manganese motor driven sand pump, 2500 GPM, when pumping 10% solids, cap.—90 cu. yds. per hr.; 15% solids, cap.—135 cu. yds. per min., 500 RPM.

PHILADELPHIA TRANSFORMER CO.
Box 566 Dalton, Pa.

FOR SALE: 550'—36" HEAVY DUTY CONVEYOR

complete with rollers on steel sections, head and tail pulleys, and electric motors, excellent condition. Prices on request, f.o.b.

W. L. JOHNSON CONSTRUCTION CO. AND ASSOCIATES
P. O. Box 6668, Bexley Station, Columbus 9, Ohio
Phone: Groveport, Ohio 3-1327

FOR SALE

2—Euclid Scrapers, Model 14TD-218H, year 1954, slightly used, excellent condition.

Charter Oak Construction Co., Inc.
525 Main Street, Hartford, Conn.
Telephone—Jackson 7-3203

EARTH BORING MACHINES . . our business

We manufacture Sterling Hydraulic Control Earth Boring Machines in sizes and models to fit your job and budget.

Sterling Model "A" for heavy duty work
Sterling Enterpriser, 6 cylinder model
Sterling Enterpriser, 4 cylinder model
Sterling Prospector, built for REA and telephone work

Complete parts are available for Sterling, Jaques and other make earth boring machines. We completely rebuild and repair all makes diggers in our well equipped shops.

SALES *SERVICE* *ANY WHERE IN NATION*

WYOMING VALLEY EQUIPMENT DIV.
714 WYOMING AVE. KINGSTON, PA.

SALE OR RENT

80D—Northwest Shovel
12 —71FDT Euclids Bottom Dumps
6 —43FDT Euclids Bottom Dumps
1 —Euclid Water Wagon 5000 gal.
6 —D8 Tractors
5 —#80 Cat. Scrapers
1 —BT LAT, Scrapers
2 —TD18 Tractors

A. L. DOUGHERTY CO.
Albany, New York
830 S. Pearl St.
Chicago, Ill.
10111 S. Torrence Ave.

FOR SALE or RENT

Blaw Knox Mixing & Batching Plant, 900 yd. capacity. Two 2 yd mixers.
200 ton American Guy Derrick 160′ Bm.
25 ton American Stiffleg Model 846.
140 HP 2D Diesel Hoists 15000# SLP.
100 HP Lucey Portable Boilers. 200# WP.
50 ton American Diesel Loco. Crane 1947.
25 ton Ohio Diesel Loco Crane new 1947.
80 ton Whitcomb Diesel Elec. Loco. 1943.
50 ton Whitcomb Diesel Elec. Loco. 1943.
2½ yd Manitowoc 3500 Diesel Crane.
60 ton American R-25 Elec. Revolver.
10 ton Unit Mobile Crane Model 1020 12 Tires. New 1946.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

YOUR OPPORTUNITY!

UNUSED Army Trucks
2½, 3½, 5-ton

GMC-DIAMOND T & INTERNATIONAL 6x6's

- *From Government Storage!*
- *Unused and Guaranteed!*
- *Factory-New Condition!*
- *Delivered on Approval!*
- *Reconditioned Trucks Also Available!*

Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

For Specifications, Prices, Delivery:
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MILTON Y. TOOMBS, Jr.
Sales Manager

MEMPHIS EQUIPMENT Company
CONSTRUCTION AND AUTOMOTIVE EQUIPMENT AND PARTS
766 SO. THIRD ST. MEMPHIS, TENNESSEE

FORSYTHE EQUIPMENT CO., INC.

MANITOWOC SPEEDCRANES
RENTALS

Capacities to 70 Tons
Booms to 140 ft. and 30 ft. jibs.
Special rates on long rentals
Exeter 2-6125 37-11 Vernon Blvd.
Long Island City 1, New York

BINS FOR SALE

Blaw-Knox Aggregate 3 compartment 100 Ton. Single Batcher, Beam Scale
Heltzel Aggregate 3 compartment 100 Ton, Dual Batcher, Dial Scale
Blaw-Knox Aggregate 2 compartment 100 ton, Dual Batcher, Beam Scale
Heltzel Cement 400 Bbl. Dual Batcher, Dial Scale

Prices on request, f.o.b.

W. L. JOHNSON CONSTRUCTION CO. AND ASSOCIATES
P. O. Box 6668, Bexley Station, Columbus 9, Ohio
Phone: Groveport, Ohio 3-1327

LIGHT PLANTS

Kohler Model "E" 1500 Watt. Price $350.00
Kohler Model 2ME 2000 Watt. Like New—Price $500.00

ANDERSON EQUIPMENT CO.
Box 1737, Pittsburgh 30, Pa.
Phone: LEhigh 1-6020

FOR SALE

I BEAM TRAILER 70 TON ROGERS

25 Foot Deck Excellent Rubber
Price $6000.00

BREWSTER EQUIPMENT CO.
Bogota, N. J. DI 2-2000

NEW AND REBUILT
STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton — 18" to 56" Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Pennsylvania

FOR SALE

DIESEL ELECTRIC LOCOMOTIVES

STANDARD GAUGE
25 - 35 - 40 - 50 - 65 - 75 - 100 tons
and
6 Alco - 1950 - 1500 H.P.
2 Alco 115 ton - 900 H.P. 0-4-4-0
8 wheel
Write for Details
FRANK M. JUDGE & CO., INC.
7010 Empire State Building
New York 1, N. Y.

For Sale!

CENTRIFUGAL PUMPS

1—Fairbanks-Morse single stage, 24" horizontal dis., 30" bottom suction. 25 M.G.D. at 210′ head.

2—DeLaval 450′ head, 6950 G.P.M., type P 16".

1—18" Double suction volute, 10,000 G.P.M., 50′ head.

1—DeLaval 8" horizontal suction, 8" horizontal discharge, 2,100 G.P.M. 108" head.

MACHINERY & STEEL DIVISION
UNITED IRON & METAL CO.
2545 Wilkens Ave., Baltimore 23, Md.
Telephone: Gilmor 5-5600

For Sale at Most Attractive Price

Lima Shay 50-ton geared locomotive and 30 Sanford Day 18-ton bottom dump automatic cars. 36" track gauge. Very good operating condition.

L. T. PUTMAN
Box #31 Beckley, West Virginia
Telephone: 5432

COMPRESSOR DIRECTORY

World's Best Rebuilts

55′ Lindsey	(2)	wheels
60′ Worth. or LeRoi	(2)	wheels
70′ Smith	(2)	wheels
75′ Worth.	(2)	wheels (5)
105′ Worth.	(2)	wheels
105′ Worth.	(4)	wheels
125′ Worth.	(2)	wheels
105′ Joy	(2)	wheels
105′ Sullivan	(4)	wheels
120′ Smith	(2)	wheels
210′ Worth.	(4)	wheels (3)
315′ Worth. Diesel	(4)	whels
315′ Jaeger Diesel	(4)	wheels
500′ Worth. Diesel	(4)	wheels (4)
600′ Worth. Diesel	(4)	wheels (5)
630′ Joy Diesel	(4)	wheels (3)

American
AIR COMPRESSOR CORP
DELL AVE & 48th ST. NORTH BERGEN, N. J.
Telephone UNion 5-4848

AGSCO ENGINEERED DIESEL POWER

STATIONARY—PORTABLE—MOBILE & MARINE
New and Remanufactured
100 to 2000 HP . . . 60 to 1500 KW
New Parts For All Engines
Write for Brochure
A. G. SCHOONMAKER CO., INC. Main Office—Sausalito, Calif., Sausalito 1600 Branch—50 Church St., N. Y. 7, N. Y., Digby 9-4350

DON'T WAIT
WF-H BEAMS
PILE SECTIONS
NEW · USED · IN STOCK

8" B P	36#	19/35'
10" B P	42#	45/50'
12" B P	53#	60/65'
14" B P	73#	60/65'
14" B P	89#	60/65'

We are also interested in purchasing your surplus material.

We assure you our prices will be the best obtainable.

Call HY DRACHMAN
STEEL CORPORATION
14-23 34th Ave., Astoria, N. Y.
Phones: AStoria 8-4484 8-8023

BLOCKS

2—5-Ton AMERICAN 14" Single Sheave with Swivel Hook & Cheek Weights.
1—20-Ton AMERICAN 18" Single Sheave with Swivel Hook & Cheek Weights.
2—25-Ton MANITOWOC 16" Double Sheave with Swivel Hook & Cheek Weights.
1—30-Ton AMERICAN 20" Double Sheave with Swivel Hook & Cheek Weights.
1—30-Ton MANITOWOC 20" Double Sheave with Swivel Hook & Cheek Weights.
1—40-Ton MANITOWOC 16" Double Sheave with Swivel Hook & Cheek Weights.
2—50-Ton MANITOWOC 16" Triple Sheave with Shackle.
1—15-Ton Triple Sheave 12" with Shackle.

ANDERSON EQUIPMENT COMPANY
Box 1737, Pittsburgh 30, Penna.
Phone: LEhigh 1-6020

FOR SALE or RENT

1—Full Revolving Electric Gantry Crane, 440-60-3
1—Full Revolving Steam Gantry Crane, 40 tons capacity
1—Full Revolving Steam Crane 60 tons capacity, for barge or gantry mounting
1—955-A P&H Diesel Crane, with Fairlead, only 400 hrs.
2—250' Car Floats or Barges
1—lot of Blaw-Knox Steel Forms like new, suitable for dams or walls
1—Steel Stiff Leg Derrick, 25 tons capacity, 80' boom. Complete with electric hoist.

WILLIAM P. SWIFT
P. O. Box 174 Springfield, Pennsylvania
Swarthmore 6-8999

2400 LIMA
STANDARD SHOVEL FRONT

40' Boom, 30' Handle, 6 Yard Dipper. Used about 6 months on easy work. Bargain.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

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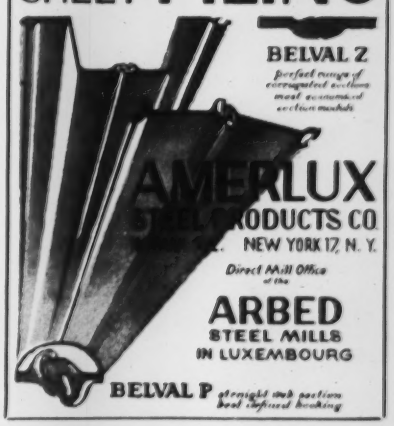

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Editorials

Something to Remember

GENERAL MOTORS PERFORMED A VALUABLE SERVICE for the engineering and architectural professions and the construction industry when, a decade ago, it conceived its Technical Center, dedicated last week, as a building group of utmost modernity. By adopting such an attitude of progress, it not only provided its own research people with efficient and inspiring facilities, but it influenced the adoption by others of interesting and new building designs. Sandwich walls, luminous ceilings, high velocity air conditioning, and space frames are some of the new building elements that the Technical Center fostered.

On the cover of this issue the General Motors Technical Center buildings are referred to as "novel today, normal tomorrow", a description that emphasizes their significance in setting a pattern and establishing a pace for progress.

But while these buildings have an obvious impact in this respect because they occur in a single project, they are merely indicative of the influence that every new building of advanced design exerts. Here is something to remember, for, while projects like the Technical Center are rare, individual buildings offer advanced design opportunities every day.

Doubt Is a Good Thing

ONE OF THE RESPONSIBILITIES OF ENGINEERS is to find solutions to problems, regardless of precedent. This does not mean that precedents should be ignored, but it does mean that they always should be questioned. Why is something done a certain way? Would doing it differently, or even directly opposite, be better in a particular case?

Such a state of doubt often pays off in good decisions, even when a seemingly sacrosanct precedent is in question. For example: A whole new system of new roads was required on the campus of North Dakota State College. From time immemorial, roads have been crowned in the center so they will drain both ways to the curbs. Such a standard procedure should hardly be subject to doubt. But Prof. John A. Oakey, chairman of the college's department of civil engineering, was not that easily satisfied.

Checking into the advantages that a centerline crown offered, for the conditions that he had to satisfy, Prof. Oakey developed some doubts, with the result that he reversed precedent by casting his concrete road slabs with a troughed instead of a ridged cross section.

What was gained? For one thing, only one drainage inlet, in the center of each intersection, was required instead of four, one at each corner. Moreover, in North Dakota winters, curb inlets get clogged with ice and snow pushed to the side by snowplows, while a center inlet will remain open. It also developed that in icy weather parked cars could back away from the curb more easily since they were moving "downhill." One disadvantage—the smaller discharge capacity offered by a single drainage inlet—was accepted on the philosophical grounds that some ponding at the inlet keeps the sewers from being surcharged.

On balance, the design paid off for the condition to be met, proving again that doubt is a good thing, even when applied to such a time-proven practice as center-crowning of pavements.

Rapid Transit Stalled

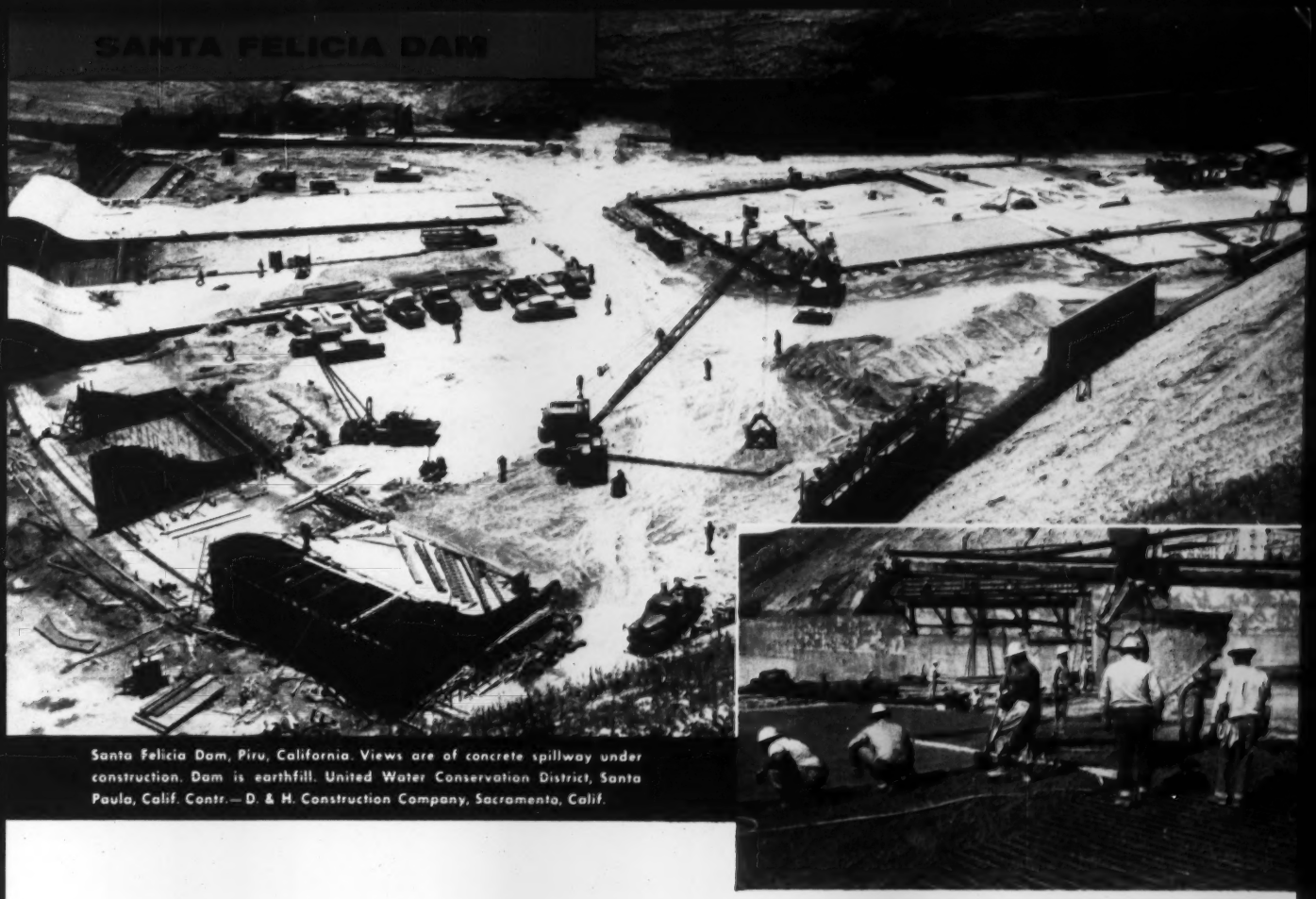
ONE OF THE MORE NOTEWORTHY ASPECTS of the recent session of the California legislature is its failure to take any action on San Francisco Bay area rapid transit. After detailed study, an engineering report had recommended a $1.5 billion program (ENR Jan. 19, p. 25), and later another report proposed several possible financing schemes (ENR Mar. 22, p. 109).

One reason for lack of legislative action may be that the basic plan is already in need of revision. Recently announced industrial developments on the San Francisco Peninsula practically make it necessary that the route indicated for initial construction be changed. Also bearing on the rapid transit matter is the fact that the legislature is permitting construction of the six-lane vehicular trestle-tube project, known as the Southern Crossing of the bay. It is contended that this facility will reduce the immediate need for—and perhaps make economically unfeasible—a separate rapid transit crossing.

But perhaps an even more important reason for legislative in action is that the rapid transit scheme will require some form of public subsidy no matter what kind of financing plan is finally settled on. Public subsidy will be hard to sell the voters. And there is as yet no great public demand for rapid transit.

Expert opinion indicates that mass rapid transit is necessary for the future economic well-being of the San Francisco Bay area. But several big hurdles still exist. First agreement must be reached on which financial plan is best. Then the need for rapid transit and the necessity for public subsidy must be sold to the people. When public demand is aroused the legislature will be quick to act.

Who can best arouse the demand is not certain. The San Francisco Bay Area Rapid Transit Commission presented its plan to as many people as would listen, but the commission is not in a good position to influence mass thinking. It now appears that an unofficial citizens' group must take over, at least until public sentiment fully favors the program.



Santa Felicia Dam, Piru, California. Views are of concrete spillway under construction. Dam is earthfill. United Water Conservation District, Santa Paula, Calif. Contr.—D. & H. Construction Company, Sacramento, Calif.

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the key to control of—

- ★ water content
- ★ entrained air
- ★ rate of hardening

Lowest possible unit water content for a given workability, and rigid control of entrained air and rate of hardening are important advantages of Pozzolith in obtaining uniform, better quality concrete and reduced costs.

Pozzolith was used in the concrete for Santa Felicia Dam to improve workability of the mix, making possible a reduction in unit water content. As the result of reduced unit water content, required strength was obtained at lower cost and other properties of the concrete were improved.

In the construction of many dams the world over, as well as other types of concrete work, Pozzolith has proved a valuable aid in economically obtaining uniform, better quality concrete with available materials. This is because Pozzolith provides the three controls required for optimum concrete performance. (See left.)

Ask us to demonstrate the advantages of Pozzolith controls for your project. Also send for copy of 48-page illustrated booklet "Master Builders Reporter on Hydraulic Projects."

COLORED MOTION PICTURE, "The Man With The Trowel", shows how Pozzolith greatly improves your control of concrete quality. Film available for private showing to groups of any size.

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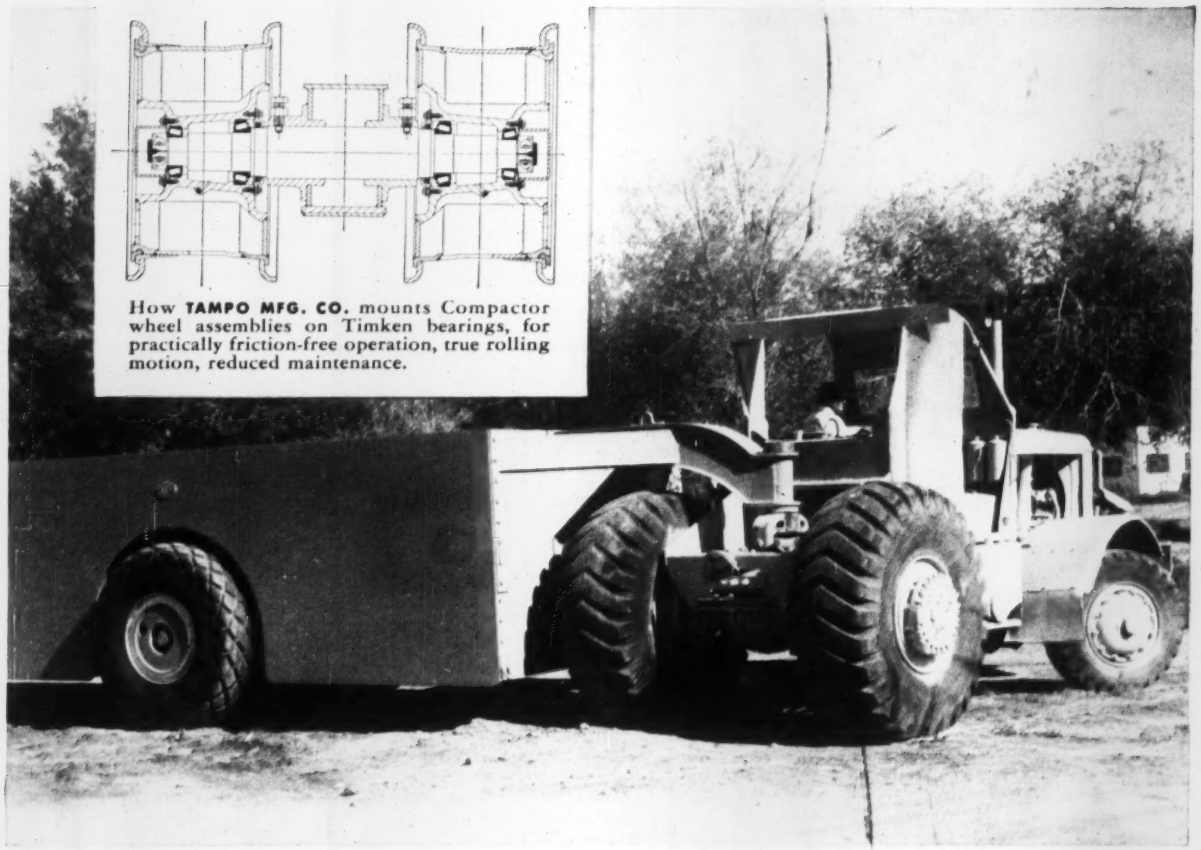

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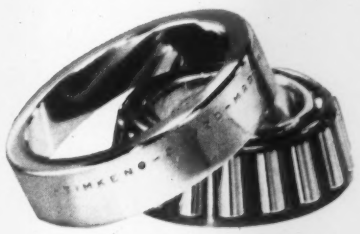

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